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Nurses as essential linchpins in the home care context

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Making ‘it’ work

Nurses as essential linchpins in the home care context

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Making ‘it’ work

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Nurses as essential linchpins in the home care context

Roger Larsson

LUND
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DOCTORAL DISSERTATION

Doctoral dissertation for the degree of Doctor of Philosophy (PhD) at the Faculty of Engineering at Lund University to be publicly defended on the 29th of November 2024 at 09.15 in Stora Hörsalen, IKDC, Klas Anshelms väg 20, Lund, Sweden.

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Title and subtitle: Making ‘it’ work - Nurses as essential linchpins in the home care context

Abstract: Registered- and community health nurses in municipal home care (hereafter referred to as home care nurses) have a demanding job that is special compared to other forms of healthcare. The work is mobile, and care in the field is often carried out in solitude. At the same time, the patients being cared for often have complex care needs, requiring cooperation and interaction. Contact with colleagues in overlapping settings is frequent. Work responsibilities are clearly divided, but the work situation is clearly co-dependent. At the same time, contact with other actors can be poor. As the home care nurse is the hub of healthcare in the municipality, this makes their work situation demanding.

The overall aim of the thesis is to increase knowledge about the psychosocial work environment of Swedish home care nurses with emphasis on teamwork, communication, and technology use. More specifically, the focus is on how they make communication and their situation work. By analyzing this from theoretical frames of reference, increased understanding of how communication can affect conditions in the psychosocial work environment and working together can be achieved. The thesis research has been conducted within the framework of two projects. The first research project investigated the introduction of interprofessional mobile teams in Scania and their impact on the work environment of municipal health- and care staff. The second research project investigated how the COVID-19 pandemic affected the work environment of care workers. This thesis encompass one scoping review and four empirical papers. The approach in this thesis was qualitative and explorative, with a methodology inspired by ethnography. The data collection methods consisted of semi-structured interviews and shadowing.

The results of the thesis show that teamwork in the home care context is not a well-researched area. However, the existing literature indicates that teamwork can be an important source of support for home care nurses to maintain control over their situation and to find support in their work. The results show that despite the region-wide implementation of mobile teams in Scania, the practice was rarely developed successfully. The success factors found in organizational precedents and in the scientific literature were missing in the municipalities studied.

It is important for home care nurses to work together and communicate at work to cope with the work situation. Nurses work together with others in the municipality, as well as with regional and private providers. Technology is important here, as it is used as a medium through which communication flows enables interaction at a distance. On the one hand, with the right combination of various media’s capacity to convey communication and the processes needed to work and solve tasks, the psychosocial work environment can be promoted. On the other hand, if this combination is not right, the work environment can be negatively affected. Home care has started to undergo a digitalization process that historically has not been very technology intense. The pandemic accelerated this process and forced new ways of working to maintain home care provision and to protect staff. The pandemic accelerated this process and forced home care nurses to adopt new ways of working to maintain home care provision and to protect staff. New technologies were introduced to maintain interaction during a time of social distancing, all of which subsequently met different fates based on how they fit the conditions present after the pandemic.

In conclusion, it can be said that teamwork, communication, and technology use influence people's psychosocial work environments. At the same time, the psychosocial work environment shapes both the conditions in which people work together and their communication. Nurses' work situations are strained and our need for nurses is great. It is therefore important to provide nurses with the working conditions they need to feel good and to excel in their work.

Key words: Home care, nursing, psychosocial work environment, teamwork, communication, technology use, COVID-19, sociomaterialism, socio-technical system

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MADE IN SWEDEN

To my grandparents, whom we lost during this time.

Table of Contents

Populärvetenskaplig sammanfattning 11
Appended papers 13
Author's contribution to the papers 14
Other publications by the author 15
Peer-reviewed journal papers as a co-author 15
Project reports 15
Conference papers and proceedings as a co-author 15
Conference abstracts as the main (and presenting) author 16
Conference abstracts as a co-author 16
List of figures 17
List of tables 17
Medical subject headings and definitions 17

Acknowledgements 20

Chapter 1 **Introduction 23**
1.1 Home care — its definition and place in the healthcare system 25
1.1.1 Need for changes in the home care context 26
1.1.2 Home care and COVID-19 28
1.2. Teamwork in home care 28
1.3 Communication and teamwork 29
1.4 Technology and communication 31
1.5 Aim and research questions 32
1.6 Limitations 33
1.7 Overview of the thesis 34

Chapter 2 **Frame of reference 35**
2.1 Teams and teamwork 35
2.2 Psychosocial work environment 38
2.3 Communication 40
2.4 Socio-technical theory 43
2.5 Technology adoption and change 44

Chapter 3 **Methods** **47**
3.1 The research projects and process 47
3.2 Research approach 50
3.3 Data collection 51
3.3.1 Scoping literature review 51
3.3.2 Qualitative data collection 52
3.3.4 Qualitative data analysis 56
3.4 Methodological considerations 58
3.5 Ethical considerations 60
Chapter 4 **Summary of appended papers** **63**
4.1 Paper I 63
Teamwork in home care nursing: a scoping literature review 63
4.2 Paper II 65
Interorganizational home care nursing teams: a comparison of a region wide organizational change initiative with success factors identified by forerunners and team theory 65
4.3 Paper III 67
How digital systems are used in Swedish home care nursing practice: a qualitative interview study to identify challenges and opportunities 67
4.4 Paper IV 69
Home care nurses at the heart of the communication web: communication synchronicity and effects on the work environment 69
4.5 Paper V 71
From safety to efficiency: how drivers of technology adoption changed during the COVID-19 pandemic in municipal home care 71
Chapter 5 **Discussion** **75**
5.1 Returning to the research questions 75
5.1.1 What does existing research say about teamwork in home care from the perspective of nurses? 76
5.1.2 What can the failed Scanian-wide implementation of mobile home care teams tell us about existing dynamics between Swedish municipal and regional healthcare? 77
5.1.3 What is state-of-the-art of digitalization in home care in relation to its ability to enable/disable communication? 79
5.1.4 How does communication mediation affect the psychosocial work environment among municipal home care nurses? 81
5.1.5 What did the adoption of novel technologies bring to the 'new normal' in home care nursing practice? 83

5.2 Home care nurse communication from a socio-technical perspective ...85
5.3 Research contributions and implications for practice 87
Chapter 6 **Conclusions 89**
Chapter 7 **Future research 91**
References 93

Populärvetenskaplig sammanfattning

Sjuksköterskor och distriktssjuksköterskor i kommunal hemsjukvård (hädanefter kallade hemsjukvårdssjuksköterskor) har ett krävande arbete som är speciellt jämfört med andra sjukvårdsformer. Arbetet är rörligt och vården i fält utförs ofta i ensamhet. Samtidigt har patienterna som vårdas ofta komplexa vårdbehov vilket ställer krav på samarbete och interaktion. Kontakt med medarbetare i överlappande miljöer är frekventa. Ansvaret är tydligt uppdelat, men arbetssituationen tydligt medberoende. Samtidigt kan kontakten med andra aktörer vara bristfällig. Då hemsjukvårdssjuksköterskan utgör navet för sjukvården i kommunen gör detta deras arbetssituation krävande.

Avhandlingens övergripande syfte är att öka kunskapen om de svenska hemsjukvårdssjuksköterskors psykosociala arbetsmiljö med tonvikt på teamarbete, kommunikation, och teknikanvändning. Specifikt om hur kommunikation och teknik möjliggör teamarbete och en god arbetsmiljö. Genom att analysera detta utifrån teoretiska referensramar kan ökad förståelse för hur kommunikation kan påverka förutsättningar i den psykosociala arbetsmiljön och att arbeta tillsammans. Avhandlingens forskning har genomförts inom ramen för två projekt. Det första forskningsprojektet undersökte införandet av tvärprofessionella mobila team i Skåne och deras påverkan på kommunal vård- och omsorgspersonals arbetsmiljö. Det andra forskningsprojektet undersökte hur COVID-19 pandemin påverkade omsorgspersonalens arbetsmiljö.

Avhandlingens resultat visar att teamarbete inom hemsjukvården inte är ett väl utforskat område. Den litteratur som finns indikerar dock på att teamarbete kan vara en viktig källa för hemsjukvårdssjuksköterskorna i fråga om att bibehålla kontroll över deras situationen och att finna stöd i arbetet. Resultaten visar att trots den regionsomfattande implementationen av mobila team i Skåne, utvecklades arbetsformen sällan framgångsrikt. De framgångsfaktorer som återfinns hos organisatoriska föregångsexempel och i den vetenskapliga litteraturen saknades i de kommuner som undersöktes.

Det är viktigt för hemsjukvårdssjuksköterskor att arbeta tillsammans och kommunicera i arbetet för att hantera arbetssituationen. Sjuksköterskorna arbetar tillsammans med andra inom kommun, likväl region och privata aktörer. Här är tekniken viktig då den används som medium för kommunikation mellan de olika aktörerna. Den möjliggör interaktion på avstånd. Å ena sidan, med rätt kombination mellan mediers egenskaper att förmedla kommunikation och de processer som behövs för att arbeta och lösa uppgifter, kan den psykosociala arbetsmiljön främjas. Å andra sidan, om denna kombination inte matchar kan arbetsmiljön i stället påverkas negativt. Hemsjukvård har påbörjat en digitaliseringsprocess, men den hade inte kommit särskilt långt innan pandemin. Pandemin accelererade denna process och framtvingade nya arbetssätt för att vidmakthålla hemsjukvårds-

försörjningen och att skydda personalen. Ny teknik introducerades för att upprätthålla interaktion under en tid av social distansering, och som i efterhand gick olika öden till mötes beroende på hur pass väl den matchade arbetssituationen efter pandemin.

Avslutningsvis kan det sägas att teamarbete, kommunikation, och teknikanvändning påverkar människors psykosociala arbetsmiljö. Samtidigt formar den psykosociala arbetsmiljön förutsättningar för arbete och hur kommunikation sker. Sjuksköterskors arbetssituation är ansträngd och vårt behov av dem stor. Det är därför viktigt att ge dem de förutsättningar i arbetet som behövs för att må bra.

Appended papers

Paper I

Larsson R., Erlingsdóttir, G., Persson J. & Rydenfält C. (2022). Teamwork in home care nursing: a scoping literature review. *Health & Social Care in the Community, 30*(6), e3309–e3327. doi:10.1111/hsc.13910

Paper II

Rydenfält C., Persson J., Larsson R., Johansson, G. & Erlingsdóttir, G. (2023). Interorganizational home care nursing teams: a comparison of a region wide organizational change initiative with success factors identified by forerunners and team theory. *Home Health Care Management and Practice*, *36*(3), 151-156. doi:10.1177/10848223231209926

Paper III

Persson J., Larsson R., Erlingsdóttir G. & Rydenfält C. (2023). How digital systems are used in Swedish home care nursing practice: a qualitative interview study to identify challenges and opportunities. *CIN: Computers, Informatics, Nursing*, *41*(8), 586–594. doi:10.1097/CIN.0000000000001006

Paper IV

Larsson R., Erlingsdóttir, G., Persson J. & Rydenfält C. (2024). Home care nurses at the heart of the communication web: communication synchronicity and effects on the work environment. *Global Qualitative Nursing Research*, *11*, 1–18. doi:10.1177/23333936241273145

Paper V

Larsson R., Erlingsdóttir, G., Persson J. & Rydenfält C. (2024). From safety to efficiency: how drivers of technology adoption changed during the COVID-19 pandemic in municipal home care.

Status: Submitted to the scientific journal *BMC Nursing* for review.

Author's contribution to the papers

Paper I

The authors designed the data collection approach as a team. I was responsible for data collection, searching for and collecting publications from electronic databases. I conducted the analysis together with CR and was the main author of the paper. The other authors provided feedback on the analysis and text through the writing process.

Paper II

The authors designed and prepared the field work together. I contributed to data collection and accompanied GE, CR, JP, and GJ during interviews. CR was the main responsible for the data analysis and the main author of the paper. I read and provided feedback together with the other authors on the analysis and on the writing of the paper.

Paper III

I participated in writing the ethical vetting prior to data collection. The authors designed and prepared the field work together. All authors contributed to conducting the interviews. I performed all field observations by myself and conducted 14 of the interviews either alone or together with CR and GE. JP was responsible for the data analysis and the main author of the paper. I provided feedback on the analysis performed by JP together with the other authors. I read and contributed to the writing of the paper.

Paper IV

I participated in writing the ethical vetting prior to the start of the data collection. The authors designed and prepared the field work together. All authors contributed to conducting the interviews. I performed all field observations by myself and conducted 13 of the interviews either alone or together with CR and GE. I was the main analyst and author for the paper. The other authors provided feedback on the analysis and continuously read and contributed to the writing of the paper.

Paper V

I participated in writing the ethical vetting prior to data collection. All authors designed and prepared the field work together. GE, JP, and CR conducted the interviews. I performed all field observations. I was the main analyst and author of the paper. The other authors provided feedback on the analysis and continuously read and contributed to the writing of the paper.

Other publications by the author

Peer-reviewed journal papers as a co-author

Rydenfält C., Persson J., Erlingsdóttir, G., **Larsson R.** & Johansson, G. (2023). Home care nurses' and managers' work environment during the COVID-19 pandemic: increased workload, competing demands, and unsustainable trade-offs. *Applied Ergonomics, 111*, Article 104056.

Project reports

Rydenfält, C., Erlingsdottir, G., **Larsson, R.**, Persson, J., & Johansson, G. (2023). *Covid-19 pandemins påverkan på arbetsmiljön för kommunal hemsjukvårds- och hemtjänstpersonal: lärande för framtiden och för ett mer mobilt arbetssätt: slutrapport.* Final project report to AFA Försäkring.

Rydenfält, C., Persson, J., **Larsson, R.**, Erlingsdottir, G., & Johansson, G. (2022). *Mobila tvärprofessionella hemsjukvårdsteam: påverkan på arbetsmiljön för hemsjukvårds- och hemtjänstpersonal och utformning av digitalt stöd: slutrapport.* Final project report to AFA Försäkring.

Conference papers and proceedings as a co-author

Persson J., Svensson, N., Lindmark, A., **Larsson R.**, Erlingsdóttir, G. & Rydenfält C. (2022). Can journey mapping be used to visualize information sharing in home care? In J. Lindblom, & C. Österman (Eds.), *Conference Proceedings of the 51st NES Conference 2022 Uppsala Sweden* (2nd ed, p. 179). Uppsala University.

Erlingsdóttir, G., Persson J., Johansson, G., **Larsson R.** & Rydenfält C. (2019). Lost in translation? care coordination cross contexts in Swedish homecare nursing. In R. Marcilly, C.E. Kuziemsky, C. Nohr & S. Pelayo (Eds.), *Context-Sensitive Health Informatics: Sustainability in Dynamic Ecosystems* (Vol. 256, pp. 42–47). IOS Press.

Erlöv, T., **Larsson, R.**, Boni, E., Ramalli, A., Rydén Ahlgren, Å. & Cinthio, M. (2019). Improved tracking performance in high frame rate imaging using iterative phase tracking. In *2019 IEEE International Ultrasonics Symposium (IUS)* (Vol. 2019, pp. 2158-2161). IEEE —Institute of Electrical and Electronics Engineers.

Conference abstracts as the main (and presenting) author

Larsson R. & Rydenfält C. (2023). *Control and communication in multiprofessional home care nursing work: implications for team dynamics and the work environment.* Nordpro 2023, Gothenburg, Sweden.

Larsson R. (2023). *Den kommunala hemsjukvårdens digitala system och COVID-19 pandemins effekter på teknikanvändning & arbete.* FALF (Forum för arbetslivsforskning) conference 2023, Helsingborg, Sweden.

Larsson R. (2022). *Digitala system i hemsjukvården och effekter av COVID-19 pandemin.* eHealth@LU end symposium, Lund, Sweden.

Larsson R., Persson J., Erlingsdóttir, G., Johansson, G. & Rydenfält C. (2021). *Införande av mobila tvärprofessionella hemsjukvårdsteam i praktiken: Lägesbeskrivning i fyra skånska kommuner före COVID-19.* FALF (Forum för arbetslivsforskning) conference 2021, Virtual, Online.

Larsson R., Erlingsdóttir, G., Persson J., Johansson G. & Rydenfält C. (2019). *Care coordination challenges between regional and municipal care when integrating mobile interprofessional teams in practice*. 13th NOVO Symposium on sustainable work and interprofessional collaboration in health care, Lyngby, Denmark.

Conference abstracts as a co-author

Rydenfält C. **Larsson R.**, Persson J., Johansson, G. & Erlingsdóttir, G. (2021). *Impact of the Covid-19 pandemic on the work environment in Swedish home care nursing: some preliminary results and a research agenda for the future.* WORK2021, Turku, Finland.

Persson J., **Larsson R.**, Erlingsdóttir, G., Johansson, G. & Rydenfält C. (2021). *Digitalization and mobile work in home care nursing—how does it work in everyday practice?* 21st Congress of the International Ergonomics Association, IEA 2021, Virtual, Online.

Rydenfält C., Erlingsdóttir, G., Persson J., **Larsson R.** & Johansson, G. (2019). *Införande av mobila tvärprofessionella hemsjukvårdsteam i praktiken: några preliminära reflektioner på resultat och framgångsfaktorer.* FALF (Forum för arbetslivsforskning) conference 2019, Norrköping, Sweden.

List of figures

Figure 1. Illustration of the research process. 48
Figure 2. Interviewing and shadowing 52
Figure 3. 'The act' and 'the audience' 66
Figure 4a-b. A diverse work setting 68
Figure 5a-b. Social interactions and communication synchronicity. 70
Figure 6. A social gathering through technology. 72

List of tables

Table 1. Frame of reference, research questions and appended papers. 36
Table 2. Summary of the five appended papers. 49

Medical subject headings and definitions

I have decided to refer to professional and healthcare organizational terms in relation to the Swedish MeSH standard when possible (Karolinska Institutet, n.d.). This is to anchor the terminology to an established standard and make international comparisons easier. When such terminologies are missing, I have tried to provide a description myself. Other terminologies are referred accordingly.

Care manager: (swe. *Socialsekreterare*) Profession in the Swedish municipal sector. Qualification requirement is usually a degree in social work. Care managers can work with a variety of areas within social services, such as children and young people, financial assistance, adult substance abusers, and elderly.

Community health nurses: (swe. *Distrikssjuksköterska*) Nurse specialization. Constitute nurses whose work combines elements of primary care nursing and public health practice and takes place primarily outside a therapeutic institution. Primary nursing care is directed to individuals, families, or groups in their natural settings within communities (Karolinska Institutet, n.d.).

Community health center: (swe. *Vårdcentral*) Facilities which administer the delivery of healthcare services to people living in a community or neighborhood (ibid.).

General practitioner: (swe. *Allmänläkare*) Physicians whose practice is not restricted to a specific field of medicine, i.e. take on a holistic approach across age groups (ibid.).

Home care services: (swe. *Hemsjukvård*) Community health and nursing services providing coordinated multiple services to the patient at the patient's homes. These home-care services are provided by a visiting nurse, home health agencies, hospitals, or organized community groups using professional staff for care delivery. It differs from home nursing, which is provided by non-professionals (ibid.).

Home health aides: (swe. *Hemvårdare, personlig assistent*) Persons who assist ill, elderly, or disabled persons in the home, carrying out personal care and housekeeping tasks (ibid.).

Homemaker services: (swe. *Hemtjänst*) Non-medical support services, such as food preparation and bathing, given by trained personnel to disabled, sick, or convalescent individuals in their home. (ibid.).

Hospital: (swe. *Sjukhus*) Institutions with organized medical staff which provide medical care to patients (ibid.).

Housing for the elderly: (swe. *Äldreboende*) Housing arrangements for the elderly or aged, intended to foster independent living. Housing may take the form of group homes or small apartments. It is available to economically self-supporting individuals, but the concept includes housing for the elderly with some physical limitations. The concept should be differentiated from 'homes for the aged', which is restricted to long-term geriatric facilities providing supervised medical and nursing services (ibid.).

Housing for the aged: (swe. *Ålderdomshem*) Geriatric long-term care facilities which provide supervision and assistance in activities of daily living with medical and nursing services when required (ibid.).

Licensed practical nurse: (swe. *Undersköterska*) Health personnel who do not hold professional degrees or credentials, but have completed training and are licensed to provide routine patient care under the direction of registered nurses and physicians (ibid.).

Registered nurse: (swe. Sjuksköterska) Professionals qualified by graduation from an accredited school of nursing and by passage of a national licensing examination to practice nursing. They provide services to patients requiring assistance in recovering or maintaining their physical or mental health (ibid.).

Nurse practitioner: (swe. *Medicinskt ansvarig sjuksköterska*, *MAS*) Nurses who are specially trained to assume an expanded role in providing medical care under the supervision of a physician (ibid.).

Nursing assistant: (swe. *Vårdbiträde*) [Unlicensed] nursing personnel who assist nurses in routine care (ibid.).

Occupational therapist: (swe. *Arbetsterapeut*) Professionals trained to help individuals develop or regain skills needed to achieve independence in their lives (ibid.).

Physical therapist: (swe. *Fysioterapeut*) Persons trained in a physical therapy specialty to make use of physical therapy modalities to prevent, correct, and alleviate movement dysfunction (ibid.).

Primary healthcare: (swe. *Primärvård*) Care which provides integrated, accessible health care services by clinicians who are accountable for addressing a large majority of personal healthcare needs, developing a sustained partnership with patients, and practicing in the context of family and community (Karolinska Institutet, n.d.; Vanselow et al., 1995).

Secondary healthcare: (swe. *Specialistvård*) Specialized healthcare delivered as a follow-up or in response to a referral from a primary care provider (Karolinska Institutet, n.d.).

Social services: (swe. *Socialtjänst*) The use of community resources, individual case work, or group work to promote the adaptive capacities of individuals in relation to their social and economic environments (ibid.).

Tertiary healthcare: (swe. *Tertiärvård*) Care of a highly technical and specialized nature, provided in a medical center, usually one affiliated with a university, for patients with unusually severe, complex, or uncommon health problems (ibid.).

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To Peter Svensson, Associate Professor at the School of Economics and Management, Lund University: Thank you for your kind and supportive nature, and the insights you gave me at the start of my PhD journey. Your teachings opened my third eye to a broader view of the world. Two things in particular have stayed with me: Our role and responsibility to society as researchers is as creators of new knowledge, and guardians/custodians of existing knowledge. Technology research is a hybrid between the quantitative and qualitative, bound by the laws of nature but created and handled by the hands of man.

To the municipalities and all participants in the research projects—Thank you for having contributed your time, knowledge, and experiences. Your contributions enable us to conduct research that sheds light on your situation and can improve it. This thesis is no longer just mine; it belongs to the world. I believe (and hope) something good will come from it.

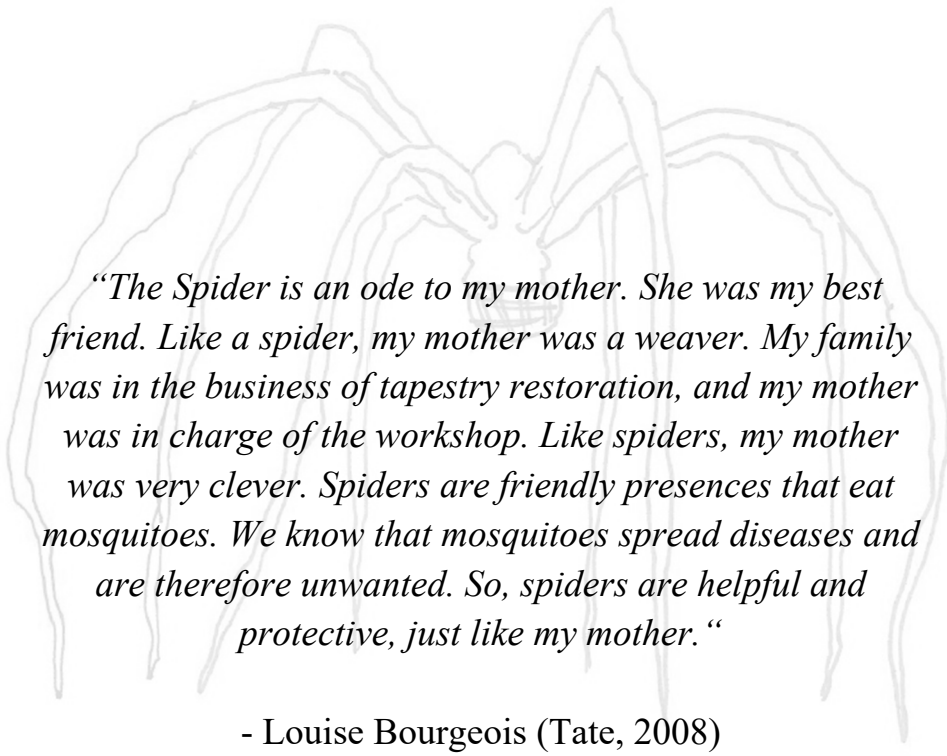
Outside of work, I would like to thank family and friends for their support over the years. I am sorry for my absence, but I plan to make changes so I can be more present in the future.

To Mom and Elly (**my smooth collie**)—Mom, thank you for your unwavering support and hard work to raise us. Being a single parent and nurse anesthetist has not been easy, but you gave us a safe, happy childhood. I will always be grateful for that and for being such a wonderful role model in life. Elly, training and being with you has changed my life. Thank you for being a good teacher, a 'good girl' and a loving companion.

To my maternal grandparents – I am sorry you are no longer with us. I wish you could have been here for my defense. Thank you for helping and supporting Mom raising us. Grandpa, thank you for being my male role model. I miss you.

To myself—thank you for having the courage to persevere through challenges. Like the carp swimming upstream the river's strong current, you have made the leap through the Dragon's Gate. Few succeed, but those who do are transformed into powerful dragons. What happens next and what you do with your knowledge is up to you!

To Jennie—By the time I send this to be printed, it is the one-year anniversary of our first date. And when I defend this thesis, we will have celebrated our one-year anniversary as a couple. Our story is something taken out of a fairytale. You are my soulmate and the love of my life, making me the happiest man alive. You are an endless source of inspiration and joy. You give me strength and courage. Together with you, I am complete. Whatever comes next, I want to share it all with you. I will enjoy spending my life and experiencing all what it means to be human with you. I love you!



“The Spider is an ode to my mother. She was my best friend. Like a spider, my mother was a weaver. My family was in the business of tapestry restoration, and my mother was in charge of the workshop. Like spiders, my mother was very clever. Spiders are friendly presences that eat mosquitoes. We know that mosquitoes spread diseases and are therefore unwanted. So, spiders are helpful and protective, just like my mother.“

- Louise Bourgeois (Tate, 2008)

Chapter 1
Introduction

I'm early to work to prepare in peace. You never know how many faxes and EHR entries there are since your last shift. Perhaps you didn't finish documenting in time. Perhaps you'll have to reply to a lot of unanswered phone calls. Before I head out myself, I meet with my homemaker service group in the morning before they head out. Homemaker services are essential—my eyes and ears in the field. I meet with my colleagues too. We deliberate on today's work, plan, and distribute tasks among ourselves if needed. Sometimes the rehab-therapists come by and want to talk about a patient. People frequently call me or come by my office to talk. I chat with everyone. We help each other out. Then I feel like we are a team. I like that.

The work is complex and demanding, and requires experience. Most of us came from other places in healthcare; but this is different from other forms of healthcare —highly proactive and preventive. Communication is key. Much of the work is about preparing, 'pushing' doctors to act, 'fixing' mistakes, catching what has fallen between the cracks. Prescriptions can be updated without your knowledge, expire, go missing. Faxes go unanswered. Information is unavailable. You must check, reach out, follow-up, and mend what is not working. Yet, doctors are important. They are 'god'. You want a good doctor. Someone who wants to collaborate and create a good relationship with you. Someone who listens, trusts you, understands you and what you do. Few are like that, however...mostly you feel like you're bothering them or are inconvenient.

Today, new and highly advanced technologies are being introduced into healthcare: wearables, artificial intelligence, auto-triage, and distance monitoring, to name a few. However, at the same time, we in home care experience trouble getting even the most basic things to work. We want compatible EHRs. We want readable medication lists. We don't want to fax. Sometimes you ask yourself what the fuck you're doing and why things are the way they are. But you have to 'switch off' your thoughts about things sometimes, what you feel and show on the outside. You have to focus on your role and task in the system. As a nurse, you can convey information. You don't have the authority to make medical decisions. I'm no doctor. I'm just a municipal home care nurse.[1]

[1] An aggregation of interviews and field observations from the perspective of municipal home care nurses in intermittent periods over three years.

Being the healthcare hub in the Swedish municipal context, registered- and community health nurses (from here on referred to simply as '*home care nurses'*) are in a demanding position. Their work situation is complex, as municipal healthcare is distinct from other forms of healthcare. Work is mobile and takes place at different locations, described as becoming more solitary as healthcare moves into homes (Öhlén, 2015). As healthcare in this context is provided outside an institutional setting, its dynamics are different. The patient is not just 'a patient', initials, or a personal number on a piece of paper—they are individuals which one visits in their homes. The place of care is therefore both a workplace and a home (Johansson, 2017). Different laws and regulations coexist that govern the work of different professional groups in this context. The patients here are often multimorbid and have complex health demands, making it necessary to work as a collective to address their needs (Bjornsdottir, 2018; Sahin et al., 2013). What Öhlén (2015) depicts as being performed in extended isolation is care work. At the same time, meetings and contact with associates in overlapping settings are frequent—in homes, public places, and in office environments. Home care nurses encounter many people: patients and their family members; licensed practical nurses and nursing assistants; physical and occupational therapists; care managers; nurse practitioners; home health aides; just to name a few. Most of them are employed by the municipality or related to the patient. However, physicians do not work in municipalities. In fact, municipalities are not allowed to employ physicians under Swedish law. Still, home care nurses are referred to physicians in community health centers or hospitals run by the regions. Work is divided yet interdependent—both the situation and the actions of others have a large influence on the situation for each individual nurse. These factors contribute to making the conditions for communication and working together more complex.

The work environment for nurses is strained. Retaining healthcare personnel is important, and improving conditions at work is key to enabling staff retention (World Health Organization, 2006). Offering healthy and positive work environments improves staff recruitment and retention, worker health and well-being, work engagement, organizational performance, quality of care, and patient safety (Möckli et al., 2020; Shamian & El-Jardali, 2007). However, nurses encounter heavy workloads, overtime, problematic scheduling, unsafe work conditions, low pay, and limited opportunities for training or career development (Racoviță et al., 2023; Shamian & El-Jardali, 2007). Furthermore, nurses experience time pressure, paperwork overload, unpredictable work conditions, and challenging interactions (Grasmo et al., 2021; Naruse et al., 2012; Vander Elst et al., 2016). In Sweden, problems such as high workload are commonly reported and many healthcare workers show symptoms of stress-related illness and consider quitting their jobs (Brulin & Elsert Gynning, 2023; The National Board of Health and Welfare, 2023a). Tensions are currently high, creating a downward spiral. Swedish nurses—including municipal nurses—have recently been striking for improved work conditions (Torkelsson, 2024; Wahrolén, 2024).

Around the world home care is expanding. The trend in Sweden at present is to transfer care into the home setting, even during advanced and long-term illness (The National Board of Health and Welfare, 2014a, 2014b). This also transfers care responsibility from hospitals to community health centers and municipal home care in the process (Stiernstedt et al., 2016).

The data aggregation in the beginning indicates the importance of collaboration, communication, and teamwork in home care. Teamwork is important in healthcare, and has been implemented in many settings to improve efficiency, patient safety, and care quality (e.g. J. Driskell et al., 2018; Welp & Manser, 2016). Teamwork in healthcare may be described as:

> "… [A] dynamic process involving two or more health professionals with complementary backgrounds and skills, sharing common health goals and exercising concerted physical and mental effort in assessing, planning, or evaluating patient care." (Xyrichis & Ream, 2008, p. 238)

The expansion of home care and the trend of transferring care responsibility to primary care demands for a specific form of teamwork that is *mobile*. Swedish health organizations are now implementing specialized "mobile teams" to enable care at home and support home care nurses more extensively (Kindbom & André, 1989; Norén & Segerberg, 2019; Region Skåne, 2023; Region Skåne & Kommunförbundet Skåne, 2016; Sveriges Kommuner och Regioner, 2018; Västra Göralandsregionen, 2019). But what is a *mobile team*? Who is part of it? How does it work in practice? And how does the team and its ways of working affect the work environment from the perspective of municipal personnel? Teamwork in municipal home care is not extensively researched. As nurses work environment is strained throughout Swedish healthcare it is of considerable importance to study and describe home care from different perspectives. This is important as the sector needs to expand.

For these reasons, this thesis investigates how Swedish home care nurses use teamwork, communication, and technology to make things work in the context of their everyday work.

1.1 Home care — its definition and place in the healthcare system

Sweden's healthcare is decentralized with a divided care responsibility (Nordic Council of Ministers, 2014; The National Board of Health and Welfare, 2020). The operation of hospitals and community health centers is managed by regions delivering primary- and specialized healthcare. At the other end, municipalities have

responsibility for elderly care and others in need of assistance (Nordic Council of Ministers, 2014).

Home care as a term (sometimes also referred to as homecare or home healthcare), is somewhat problematic, as it is broad, heterogeneous, and not necessarily clear in definition. Its organization and implementation vary greatly internationally. One way to define home care in Sweden is to go by the National Board of Health & Welfares description as "healthcare…given in the patient's home or equivalent and which is continuous over time" (The National Board of Health and Welfare, 2017). It can also be described as the involvement of varying medical, rehabilitation, habilitation, and care efforts provided by municipal or region level health- and social care organizations (Ekstedt & Flink, 2019). Home care encompass any care aiming physical or psychological conditions, can be basal or advanced, and is given in both ordinary and specially accommodated home environments (ibid.). The definition chosen for this thesis is based on the Medical Subject Heading (MeSH) for Swedish home care:

> "Community health and nursing services providing coordinated multiple services to the patient at the patient's homes. These home-care services are provided by a visiting nurse, home health agencies, hospitals, or organized community groups using professional staff for care delivery" (Karolinska Institutet, n.d.).

The Swedish MeSH-term does not limit home care delivery to regional or municipal origin. However, most home care in Sweden is provided by the municipalities. In Swedish, home care (swe. "*hemsjukvård"*) refers to healthcare delivery in the home. Thus, in this thesis, home care refers to the healthcare nurses working in municipalities provide in ordinary home environments. It is separate from informal care, in-patient care, care provided in group accommodations, and from homemaker services. Home care is formal care provided by professional caregivers to complement—or even replace—hospital care, carried out in a home environment over a longer period of time; enabling people to live at home for longer (Ekstedt & Flink, 2019; Genet et al., 2012; Thomé et al., 2003).

1.1.1 Need for changes in the home care context

The sector's already complex nature is further increased as needs are changing with its expansion in response to a combination of factors, such as changing demographics, fiscal resources, social change, and science- and technology innovations (Colombo et al., 2016; Tarricone & Tsouros, 2008). Home care is strongly associated with eldercare, and it is indeed true that many people experience increasing need for care or assistance at home as they age. However, this one-sided association of home care is unjust. In 2022, 412,000 people of all ages, walks of life, and living- and health conditions were included in receiving home care in Sweden (The National Board of Health and Welfare, 2023c). Besides the elderly, these are

people who need dialysis, cancer treatment, help with medicine, or have mental illnesses or intellectual disabilities, among other conditions.

A large driver for the ongoing transition of Sweden's healthcare into homes is its aging population. Aging populations are a global phenomenon, and the chronic health conditions that often accompany advanced age have a significant impact on individuals, households, health systems, and society. There were 727 million people above the age of 65 globally in 2020, or 9.3% of the world population (United Nations Department of Economic and Social Affairs, 2020, n.d.). By 2050, this age group will more than double to above 1.5 billion, or 16% of the world population (ibid.). For EU-27 countries, the same age group will increase from 2019's 90.5 million to almost 130 million by 2050 (European Commission: Eurostat et al., 2020). Estimates project the number of people between 65 and 74 years of age to increase by 16.6%; the 75–84 age group to increase by 56.1%; the 85–99 to increase by more than 100%; and the 100+ age group (centenarians) to increase by almost by 400% (ibid.). For Sweden specifically, the population is expected to increase by 12.5% (to 11.84 million) by 2050 (Statistics Sweden, 2023). During this time, Sweden's age groups above the estimated retirement age of 69 is expected to increase from 15.2% to 18.6% (ibid.).

However, the challenge comes not only from the increasing number of people in these age groups but also their health status. One result of living longer is the development of chronic illness. Furthermore, people are more likely to experience several conditions at the same time—i.e. multimorbidity—as they age. And as the health status of patients becomes more complex, it increases the labor intensity of care. The related expenditure is significant and is projected to increase. This suggests a need for a transition to formal home care and workforce expansion (Bureau of Labor Statistics & United States Department of Labor, 2021; European Commission, 2015; Goryakin et al., 2020; Price, 2017; Statistics Sweden, 2017). At the same time, the number of people of working age—15–64 years old—are expected to decrease. This is also true for Sweden. In EU-27 countries, the population of people below the age of 55 is projected to decrease by 13.5% between 2019 and 2050 (European Commission: Eurostat et al., 2020). In Sweden, the number of people aged 20–69 is expected to decrease by 1.2% between 2022 and 2050 (Statistics Sweden, 2023)

The requirement to expand formal care delivery at home in Sweden also increases the demand for a cohesive health system which includes municipal home care and homemaker services (Stiernstedt et al., 2016). This means that its conditions and present-day functionality need to change and improve. If left alone, the expansion and increasing complexity involved in moving care-intensive patients into the home environment is likely to bring about even more increased workloads for professionals like nurses and negatively influence their work environment. The threat of an increasingly unhealthy work environment is important to address, as a

healthy work environment for nurses is associated with improved care quality, job satisfaction, and staff retention (Ma et al., 2015; White et al., 2020).

1.1.2 Home care and COVID-19

The COVID-19 pandemic was declared in March 2020, after which society-wide adaptations had to be made to limit the spread of the virus (World Health Organization, 2022). Healthcare and care institutions worldwide experienced severe strain during this time. The pandemic affected their ability to deliver care, and affected the working conditions of healthcare personnel. Extensive research has been conducted in in-patient care settings such as wards and intensive care units (e.g. Caillet et al., 2020; Fernández-Castillo et al., 2021; Greenberg et al., 2021; Heesakkers et al., 2021; Selberg, 2022; Thuresson, 2024). Considerably less research has been conducted in the municipal home care context, of the circumstances its personnel experienced, and how working conditions were affected there.

What can be said for certain is that municipal services in Sweden were seriously affected. Sweden's choice to remain relatively open had serious consequences for eldercare, due to the inadequate measures made to protect people of advanced ages (Pashakhanlou, 2022; Melin et al., 2022a, 2022b). Eighty-nine percent of all nineteen thousand deaths in Sweden that listed COVID-19 as the reported underlying cause were over the age of 70, and 69% were enrolled in municipal health and/or social care (The National Board of Health and Welfare, 2023b). The situation of municipal personnel was severely strained and they faced major challenges. Problems related to the work environment had been common before the pandemic (Rydenfält et al., 2020; Rydenfält et al., 2021). However, existing problems intensified during the COVID-19 pandemic, while new problems were introduced. Increased psychosocial strain and workload were expressed, and work was described as being brought to a tipping point (Lövenmark & Hammar, 2023; Rydenfält, Persson, Erlingsdóttir, et al., 2023).

1.2. Teamwork in home care

Healthcare organizations are, by tradition, largely designed for specialization around areas of expertise and function. Driven by a demand for further knowledge in specific areas of medicine, specialization in healthcare has largely been positive, as it has provided opportunities for development and improved conditions for complex problem solving, saving lives through new specialized treatment and increased effectiveness of existing ones. However, it has also decreased overlap and shared knowledge between areas of expertise, which decrease the chances of

interprofessional exchange (Cook et al., 2000; Hall & Weaver, 2001). As a counter-reaction to the specialization of healthcare and the organizational silos that it has resulted in, modern healthcare strives to become patient centered—designed around patients and processes (Committee on Quality of Health Care in America, 2001).

The specialization and ability to treat more and sicker patients has resulted in healthcare becoming increasingly complex (e.g. Edgren, 2008; Plsek & Greenhalgh, 2001). As the health status among patients become more complex and the need for the involvement of different specializations increase, healthcare providers and professionals from different levels must work together and collaborate in patient care to greater extents (Britnell, 2011; Reeves et al., 2010). The matter is brought to its head in the home care context, as the need for patient care here ranges from the very basic to the highly specialized. Coping with the complexity present in home care not only demands competence but also the capability to handle unpredictability, recognize the need for adaptability, and to work in creative and flexible ways (Fraser & Greenhalgh, 2001; Plsek & Greenhalgh, 2001). One way to accomplish this is through teamwork (Tompkins, 2015).

The importance of teams in modern organizations cannot be denied. The word itself is invoked to inspire positive feelings, and it is true that teams and teamwork *can* have many positive effects. Teamwork is perceived to, e.g., increase effectiveness, job satisfaction, and provide safer and high-quality care, to name a few of its positive aspects (Kalisch et al., 2010; Reeves et al., 2010; Rosen et al., 2018; Schmutz et al., 2019; Valentine et al., 2015). Home care nurses are one of many health professionals who find themselves experiencing increasing expectations to embrace teamwork. But teamwork needs the right conditions to develop, function, and become successful; being dependent on processes and conditions such as communication, coordination, context, and culture (Rydenfält et al., 2017; Salas et al., 2015). However, what makes teamwork tricky to foster in healthcare is the presence of strong boundaries between professions, environments, responsibilities, and cultures with knowledge monopolies, hierarchies, and strong professional identities (Hall, 2005; Thunborg, 1999). This is particularly prevalent for home care nurses, as the boundaries that need to be bridged not only concern professional status and identity, but also organizations operating on different levels of the healthcare system (primary, secondary, tertiary healthcare).

1.3 Communication and teamwork

The data aggregation in the beginning stresses the importance of communication for home care nurses. Continuous communication is critical for home care nurses to manage their work. However, as the aggregation also depicts, communication is, at the same time, a continuous challenge. Home care nurses have previously been

found to consider themselves linchpins in the community (De Groot et al., 2018). Their role for communication in this context therefore not only makes them essential, but also vulnerable. Many of the nurses have conveyed experience as a necessary requirement to mastering working as home care nurses; and this includes managing communication. The importance of communication in healthcare is well-documented (Foronda et al., 2016; Ratna, 2019; Vermeir et al., 2015). For nurses, communication is important for patient safety, care quality, and for their work environment (Friesen et al., 2007; Svensk sjuksköterskeförening, 2017). However, communication failures between providers and healthcare levels are common in healthcare and pose serious risks for patients, and for patient safety in general (Örstadius, 2023). The general director of the Swedish Accident Investigation Authority highlighted the issue's severity in Swedish regional healthcare following a serious incident of a forgotten cancer patient:

> "For a number of years, we have seen that the issue with patient- and care injuries [resulting from communication failures] is so widespread that it is reasonable for the Swedish Accident Investigation Authority to go into the [healthcare] sector." –John Ahlbeck (ibid, p. 8) (Translation from Swedish by the author)

But what is the communication practice among home care nurses? Good communication is not only central to workplaces and work environments, but to all aspects of life. This is also true for teamwork (Paris et al., 2000). Communication in teams can be defined as a reciprocal process, where information is sent and received among members which forms and re-forms the team's attitudes, behaviors, and cognition (Salas et al., 2015). It is as much a process of information transmission as a social action where meaning is created. Teamwork and communication are, as dynamic and interactive processes, important to cope with complexity (Seijts et al., 2010; Stacey, 2003). Furthermore, communication and intersubjectivity between team members are important for teamwork to be successful (e.g. Billett, 2014; Marlow et al., 2018; Mesmer-Magnus & DeChurch, 2009). Meeting each other is important (Kauffeld & Lehmann-Willenbrock, 2012). Thus, it is important to provide possibilities for people to meet, communicate, and understand each other to foster teamwork. However, home care as a context is challenging in this regard, as communication and interactions among professionals are not necessarily bound to particular times or physical frameworks. Professionals from different healthcare levels partake in so-called "interorganizational communication" (Shumate et al., 2017). However, they seldom meet on a regular basis. A way to bridge this distance between professionals and allow communication to be mediated and information shared in home care is to use technology (Kamei, 2013; Lindberg et al., 2013). However, how well does the use of technology meet the needs for communication among home care nurses?

1.4 Technology and communication

Brooks (1980) describes *technology* not only as artifacts with a physical embodiment but also the underlying knowledge of the artifacts and their use in society. He conceptually defines the term as:

> "[K]knowledge of how to fulfil certain human purposes in a specifiable and reproducible way" (ibid, 1980, p. 66)

Technology has lowered barriers for communication, whether it pertains to hardware, organizational structure, or social values (Rogers, 1986). As of today, technology allows communication to a degree that people can now create, transmit, store, and share information more than ever before. Here, technology is a medium —a channel through which communication occurs. However, technology is also the use of the medium, which in turn affects aspects of work in the process of communication.

A factor that is highly influential today is the digital transformation or digitalization. Digitalization is impactful in modern organizations and highly influences their functionality (Chaudhry et al., 2006; Kuusisto, 2017; Parviainen et al., 2017). This is true for healthcare (e.g. Gopal et al., 2019; Kraus et al., 2021). This is also true for home care where it is seen as a relatively new enabler (Frennert, 2021; Genet et al., 2012; Rydenfält, Persson, et al., 2019; Rydenfält et al., 2021). Digitalization is perceived as enabling healthcare provision at home to greater extents as well as a necessity in handling future challenges (De Raeve et al., 2017; Kamp et al., 2019).

Digitalization and technological development have taken serious steps forward— introducing new and advanced technologies in the healthcare sector. Many novel and complex technologies exist in healthcare today, and many are continuously being developed and implemented. However, digitalization of communication and information access/exchange in Swedish healthcare have been found to be seriously lagging (The Swedish Accident Investigation Authority, 2023). This is surprising, as communication between healthcare specializations is highly technology-mediated. This can be exemplified by one of Swedish healthcare's most fundamental information and communication technologies: the fax. The Swedish Accident Investigation Authority (2023) highlights the problem by the following statement:

> "In this context, it is remarkable that the extensive digitization that has taken place in healthcare and society has not allowed the fax to have been phased out. Fax transmits information via an open network and must be preceded by, among other things, strong authentication when sending confidential information. It is questionable whether faxes are currently used in accordance with current regulations in this area. Although there are initiatives for digitized solutions to eventually replace the fax machine in the long run, no further implementation has yet been implemented…It is a

> fundamental issue concerning the [Swedish] healthcare system to its very core…" – (ibid, p. 49) (Translation from Swedish by the author)

Municipal home care has traditionally not been technology-intensive. Nor has it been fast to adopt new technologies. However, this is changing, as the sector is currently experiencing an increase in digitalization (The National Board of Health and Welfare, 2021a, 2022, 2023d).

Digitalization is elevated as important for patient autonomy and safety through the use of various welfare technologies (Flakk Nordang & Halvorsen, 2022; Kamp et al., 2019; The National Board of Health and Welfare, 2021b). Furthermore, professionals have found that they can gain support by using information and communication technologies (Lindberg et al., 2013). When accessible through portable devices, work can be enabled to become more mobile and can be performed out in the field (Rydenfält, Persson, et al., 2019; Yang et al., 2019). Thus, indications exist suggesting that digitalization can play an even more important role in the future of home care and home care nurses' work as part of an integrated care system (Shah et al., 2022; Wynn et al., 2023).

However, despite an increase in recent years, digitalization in home care has proven difficult (Frennert, 2021; Frennert & Östlund, 2018; Rydenfält et al., 2020; Östlund, 2017). So how does technology and the difficulties inherent to digitalization affect the work situation of home care nurses in Sweden? There is not much research within this field. The narrative in the beginning of this section provides a picture of municipal home care, which, compared to the digitalization of region-based healthcare, is struggling to meet even the most basic needs. This stands in strong contrast to conceptions that technology adoption should provide opportunities for healthcare professionals to engage in collective work (Aceto et al., 2018). Technology plays an important role in mediating communication and facilitating the right social and cognitive processes within collectives (Woolley & Gupta, 2024). However, human–technology interaction has the dual possibility to both cope with and create complexity (Hollnagel, 2012). This, in turn, effects the work environment. Thus, the materiality of communication and its facilitation through technology is important for distributed forms of teamwork and its effects on the psychosocial work environment of professionals.

1.5 Aim and research questions

The aim of this thesis is to increase knowledge of Swedish home care nurses' psychosocial work environment, with an emphasis on teamwork and technology use, specifically with regard to communication and how it makes their situation work. The research questions (RQs) for this thesis are as follows:

RQ1. What does existing research say about teamwork in home care from the perspective of registered nurses?

RQ2. What can the failed Scanian-wide implementation of mobile home care teams tell us about existing dynamics between Swedish municipal and regional healthcare?

RQ3. What is state-of-the-art of digitalization in home care in relation to its ability to enable/disable communication?

RQ4. How does communication mediation affect the psychosocial work environment among municipal home care nurses?

RQ5. What did the adoption of novel technologies bring to the 'new normal' in home care nursing practice?

1.6 Limitations

First, this is a thesis based on qualitative research. Qualitative research has sometimes been criticized for not being generalizable, e.g. single case studies to populations (Yin, 2014). From this perspective, research findings from the perspective of authors are consequently not generalizable outside the municipalities of which the research has been conducted. However, generalization is possible for theoretical proposition also known as analytic generalization (Firestone, 1993; Yin, 2014). Flyvbjerg (2006), on the other hand, argues that generalization is indeed possible to whole populations through the process of falsification. Additionally, many scientific disciplines work with a limited number of cases (Gobo, 2011). In any case, the research findings can be generalizable from the perspective of the reader, based on their own personal recognition of the findings' applicability. In other words, if the reader recognizes themself in the descriptions of the research findings, these findings may be relevant to other settings as well. This is known as case-to-case transfer, which requires a "rich, detailed, thick description of the case" (Firestone, 1993, p. 8) to be effective.

Second, this thesis reflects the perspective of registered- and community health nurses working in municipalities; i.e., home care nurses. The intent of this thesis is a 'home care nurse-centered' focus rather than a 'patient-centered′ to increase awareness of the nurses' work environment and provide an understanding of how it may be improved. Still a better work environment is assumed to improve patient care and to be in the best interest of patients.

1.7 Overview of the thesis

This is a compilation thesis consisting of five chapters and five appended papers. Chapter 1 provides the introduction, introducing the research area and specifying the research aim and research questions. Chapter 2 presents the thesis' frame of reference. Chapter 3 describe the research process, the methods used to achieve the thesis' aim, and the methodological and ethical considerations made during the research period. Chapter 4 summarize the appended papers. Chapter 5 discusses the findings by returning to the research questions and presents a summary of the main contributions in the thesis. Chapter 6 presents the thesis' conclusions and final insights. Chapter 7 suggests areas for future research.

Chapter 2

Frame of reference

This chapter presents an overview of the selected theoretical models relevant for analyzing and discussing the research findings. The research presented in this thesis is situated in the intersection of teamwork, psychosocial work environment, communication, socio-technical systems, and technology adoption and change. In the following sections, I will describe theoretical concepts of teams and teamwork, the psychosocial work environment, communication, socio-technical theory, and technology adoption and change. The connections between the thesis' frame of reference, its appended papers and research questions are presented in Table 1.

2.1 Teams and teamwork

The word 'team' has a strong association with a collective identity. Etymologically, in its meaning of performing a joint effort for some purpose, it stems from Old English applicable to both humans and yoked animals (Oxford English Dictionary, n.d.). Teamwork has likely been important for survival for the entire history of our species (T. Driskell et al., 2018). However, teamwork is far from exclusive to humans. Many species in nature work in teams: ants, bees, ravens, wolves, whales, apes, and elephants; just to name a few. An evolutionary advantage can therefore be advocated for species who work well in teams; enabling the collective to achieve more than the one individual could on their own. Humans are social animals who live and operate in groups. Understanding group processes is important to understand teams. A group can be understood as three or more people with a common goal who are interdependent on each other to achieve the goal, are aware of each other's existence, and perceive themselves to be a group (Lennéer-Axelson & Thylefors, 2005). A team can be considered a group. However, a group may not necessarily be a team. This is important to distinguish, as the terms 'team' and 'teamwork', in fact, are highly hyped but their use in healthcare is afflicted with confusion and inconsistency (Flores-Sandoval et al., 2021; Lyubovnikova et al., 2015; Rydenfält, Borell, & Erlingsdottir, 2019).

Table 1. Frame of reference, research questions and appended papers.
The thesis' frame of reference and connection to the research questions and appended papers.

TITLE	THEORETICAL PERSPECTIVES	RESEARCH QUESTION
Paper I: **Teamwork in home care nursing: A scoping literature review**	Teams and teamwork	RQ1. What does existing research say about teamwork in home care from the perspective of registered nurses?
Paper II: **Inter-organizational home care nursing teams: a comparison of a region-wide organizational change initiative with success factors identified by forerunners and team theory**	Teams and teamwork	RQ2. What can the failed Scanian-wide implementation of mobile home care teams tell us about existing dynamics between Swedish municipal and regional healthcare?
Paper III: **How digital systems are used in Swedish home care nursing practice: a qualitative interview study to identify challenges and opportunities**	(Empirically descriptive) Communication Socio-technical systems	RQ3. What is state-of-the-art of digitalization in home care in relation to its ability to enable/disable communication?
Paper IV: **Home care nurses at the heart of the communication web: communication synchronicity and effects on the work environment**	Communication Psychosocial work environment Socio-technical systems	RQ4. How does communication mediation affect the psychosocial work environment among municipal nurses?
Paper V: **From safety to efficiency: how drivers of technology adoption changed during the COVID-19 pandemic in municipal home care**	Communication Technology adoption and change Socio-technical systems	RQ5. What did the adoption of novel technologies bring to the 'new normal' in home care nursing practice?

Teams and teamwork have been extensively studied in healthcare, and are mostly highlighted as positive and desirable. They are often taken for granted as a 'good thing'. Different perspectives exist on groups and teams in the scientific literature pertaining to the topic (Smith, 2001; Van de Ven & Poole, 1995). Two illustrative

examples of team definitions are made by Wheelan (2005) and Salas et al. (2000). According to Salas et al. (2000), a team is defined as:

> "[A] set of two or more individuals interacting adaptively, interdependently and dynamically towards a common and valued goal… In addition, team members are each assigned specific roles/functions to perform, and a team has a limited life span." (ibid, p. 341)

Wheelan (2005) distinguishes a team from a work group in the following statement:

> "A work group is composed of members who are striving to create a shared view of goals and to develop an efficient and effective organizational structure in which to accomplish those goals. A work group becomes a team when shared goals have been established and effective methods to accomplish those goals are in place." (ibid, p. 2)

There is a distinction between the perspectives provided by Salas et al. (2000) and Wheelan (2005). The first highlights a perspective focusing on what team aims to accomplish—i.e., their function. This perspective focuses on concepts of teamwork such as leadership, performance monitoring, adaptability, and orientation (e.g. Rosen et al., 2018; Salas et al., 2005). The second focus views teamwork as an evolution, or what happens between individuals and the relationships that they form —i.e., as a process (e.g. Goleman et al., 2002; Wheelan, 2009). Whatever the perspective, it is common to view groups and teams as social entities with finite lifespans going through developmental stages over time. Tuckman's model describes group development as being comprised of five stages: *forming, storming, norming, performing,* and *adjourning* (Tuckman, 1965; Tuckman & Jensen, 1977). Wheelan's model is similar, depicting group development as a four-stage process: *dependency and inclusion*, *counter-dependency and fight*, *trust and structure*, and *work and productivity* (Wheelan, 1990, 1994). Groups progress through stages dealing with issues as member identities and dependency and trust and relationship-building, progress toward becoming more mature. The process does not necessarily have to be steady, and some groups never mature. Groups can progress and regress between stages throughout their life cycle.

Closely related to teamwork are the terms *network*, *cooperation*, and *collaboration*. Pulling from arguments made by Dow et al. (2017), Reeves et al. (2018) gave an extended categorization of interprofessional work connecting the four terms. *Teamwork* is considered the most complex form of collective work, with unpredictable, urgent, and complex tasks (ibid.). *Collaboration* is 'looser', where shared identity and member integration are not seen as being as important. Tasks are a little more predictable, and are less urgent and complex compared to those assigned to teams. *Coordination* is like collaboration in terms of shared identity. However, it is less dependent on member integration and interdependency. Task predictability is higher, while task urgency and complexity are lower. *Network*

connotes collective work, where shared identities and responsibility, the clarity of roles and goals, and the integration and interdependence among members are less essential. Networking tasks are predictable, non-urgent, and non-complex.

In this thesis I approach teams and teamwork from a relational and collectively supportive perspective. My definition of a 'team' in this thesis, like that of Wheelan, acknowledges that a *team is a group of people which is stable and longstanding enough for the members to have established relationships with each other, are supportive, and who have trust in and mutual respect towards each other with positive feelings of belonging and a shared group identity.* Furthermore, I identify teamwork as a highly complex form of collective work according to Reeves et al.'s (2018) *network-cooperation-collaboration-teamwork* continuum. The theoretical concepts of teams and teamwork are used in this thesis to distinguish the types of collective work home care nurses engage in in their work to understand the requirements of social interaction and processes enabled through communication media.

2.2 Psychosocial work environment

The work environment is important to the workplace and constitutes both physical and psychological dimensions. The psychosocial work environment is a commonly used term established as being important to workers mental health and includes perspectives from individual experiences to macro-level societal and organizational structures (Rugulies, 2019; Stansfeld & Candy, 2006). Thus, the 'psychosocial environment' is a broad term referring to all aspects of individuals' work situations affecting them on a psychological or social level.

However, the concept of 'psychosocial' can be argued as placing too much focus on psychological phenomena and individuals instead of on the work environment and the organization (Mutaner & Chung, 2005; The Swedish Work Environment Authority, 2015). The Swedish Work Environment Authority (2015) has chosen to refrain from using this term and instead distinguishes between organizational and social factors:

> "[The organizational environment is the]…terms and conditions for…work that include: 1. management and governance; 2. communication; 3. participation, latitude to act; 4. assignment of tasks; and 5. requirements, resources, and responsibilities." (ibid, p. 7)

> "[The social work environment is the]…terms and conditions for…work that include social interaction, collaboration, and social support from managers and colleagues" (ibid, p. 7)

This distinction switches focus onto the conditions and requirements of work environments that organizations can control. There are multiple models and theories used to describe and explain work environment phenomena (e.g. Bakker & Demerouti, 2007; French et al., 1982; Karasek & Theorell, 1990; Siegrist, 1999).

The Job Demand-Control-Support (JDCS) model is one of the most popular, well-researched, and highly influential theoretical models used to describe job strain, linking working conditions to stress (Johnson & Hall, 1988; Karasek & Theorell, 1990). The model describes psychological strain (stress) as resulting from three interacting factors present in the work environment often visualized as a three-dimensional property space: demand, control (decision latitude), and support. The work environment is considered 'healthy' when levels of control and support are experienced as being high enough to meet the demands presented by work. As demands increase, so does the need for control. The support factor acts as a buffer when control decreases. The model postulates that work becomes unhealthy, even dangerous, when experienced demand levels are too high in combination with low levels of control and support. However, too-low demand levels at work are not considered beneficial either, as this can have a negative effect on work motivation.

The Job Demands-Resources (JD-R) model is similar to JDCS (Bakker & Demerouti, 2007; Demerouti et al., 2001). However, this model's demands dimension is expanded to include both physical and psychological demands, while at the same time combining the control and support dimensions under the broader scope of 'resources'. Resources are here defined as physical, psychological, social, or organizational work factors which decrease demands and associated physical/psychological costs, support work goal achievements, and stimulate personal growth, learning, and development. These resources can be both external and internal, existing in the workplace or among people, respectively. The model postulates that the provision of the right resources in a work environment can buffer the effects of job strain and increase work motivation.

Compared to JDCS and JD-R, the focus of analysis in the Effort-Reward-Imbalance (ERI) model is shifted from control, support, and resources, respectively, to rewards. This model demonstrates how imbalance between psychological effort, reward, and work commitment can influence health and well-being (Siegrist, 1996, 1999, 2016). Siegrist (1996) define efforts in the original model to be either extrinsic or intrinsic. Sources of extrinsic effort include work demands and obligations, while intrinsic sources correspond to the individual's inner job-related motivations and coping strategies. Rewards can be related to monetary value, status control, esteem, or respectability. The model was later updated by relabeling intrinsic effort into overcommitment, and rewards in terms of status control into job security and career opportunities (Peters & Hopkins, 2014; Siegrist, 1999). The ERI model postulate three predictions: 1) high imbalance between extrinsic effort combined with low levels of rewards increase the risk of poor health; 2) high levels of overcommitment combined with inadequate rewards increase the risk of poor health; and 3) high

extrinsic effort–reward imbalance, combined with high levels of overcommitment lead to the highest risks of poor health (Van Vegchel et al., 2005; Siegrist, 2002).

A fourth theoretical perspective is that of Person-Environment (P-E) fit theory, which focuses on the interaction between individuals and their environment. This theoretical perspective postulates that the fit between an individual's characteristics, values, and the environment they inhabit can affect motivation, behavior, and health. Conceptual distinctions have been made between 1) environmental supplies, or personal motives, goals, and values; and 2) environmental demands, or personal skills and abilities (French et al., 1974; French et al., 1982). Furthermore, individuals and environments alike have objective and subjective properties (French et al., 1982). A misfit between the subjective properties of the environment and person will produce strain—i.e., physiological, psychological, and behavioral outcomes negative to their health and well-being.

Karasek and Theorell (1990) JDCS model is useful to identifying why personnel experience stress from the levels of demands, control, and support they experience in their work. Thus, this theoretical model is used in this thesis to answer how home care nurses experience demands, control, and support from the perspective of their communication.

2.3 Communication

The field of communication studies concerns the study of human communication and behavior, and patterns in interpersonal relationships, social interactions, and culture (Calhoun, 2011). The definition of communication is broad, even disputed, and there exists a wide array of theoretical perspectives and models to describe it. One definition that is often attributed to communication is that of a process where information is transferred between places and people. Models that describe this perspective are simplified overviews of communication as linear-, interactive-, and transactive processes, outlining their main components and interactions.

Linear classifications are characterized by that they depict communication as a transmissive process without feedback. Aristotle (384–322 B.C) acknowledged the importance of communication during antiquity, proposing a model comprised of five components: *speaker*, *speech*, *audience*, *effect*, and *occasion*. Lasswell's model (1948) analyzes communication from the perspective of five questions: "*Who?"*, "*Says what?"*, *"To whom"*, *"In which channel"*, and *"With what effects?".* The Shannon-Weaver model of communication, one of the most influential linear models, conceptualizes communication with five components: *source, transmitter, channel, receiver,* and *destination* (Shannon, 1948; Shannon & Weaver, 1949). Noise can interfere with and distort the signal being sent, which makes it harder reconstructing the original message by the receiver. Honorable mentions of this

classification also refer to Jakobsons's model and Berlo's Source-Message-Channel-Receiver (SMCR) model (Berlo, 1960; Jakobson, 1960).

Interactive communication is characterized as a two-way process where participants alternate between being sender and receiver. Feedback is given to each other on the information given. In other words, dialogue exists. Schramm's model (1971) depicts participants as equal encoders and decoders of information, involved in a process of interpretation. The importance of shared meaning is highly stressed, suggesting that only what is shared in fields of experience, reference, and expertise is communicated. Another interactive model is Rogers and Kincaid (1981), which illustrates communication as a cyclic exchange process where communication continues until mutual understanding is reached and areas of opinions overlap.

Transactive classifications of communication extend the interactive concept further by describing it as a two-way process falling within social, relational, and cultural contexts. Models of this classification often see communication as accumulative, continuous, circular, complex, dynamic, irreversible, and unrepeatable. Barnlund's model (1970) describes communication as multilayered process for producing meaning based on external or internal cues. The model holds that people create and assign meaning to objects and the world, arriving at shared understandings to reduce uncertainty in their situation. Cues can be anything that people may attribute meaning to or anything that triggers a behavioral response. Dance's model (1967) depicts communication as a dynamic and evolutionary process of increasing complexity often visualized as an outward spiral. The growth of the spiral is driven by the sender and the recipient's shared experiences and differences, while feedback based on contextual circumstances adjusts and refines the process. A relationship evolves over time by repeated interaction, which builds trust, intimacy, and shared meaning, which build shared experiences and strengthens the understanding of the participants. Similarities and differences between sender and receiver are seen as equally important, where similarities provide common ground, and perspectival differences grant richness to the interaction.

However, communication is more than the process of transmitting information. From a constructivist perspective, it is as much about transmitting information as it is about creating meaning. It is also essential for coordination, sense-making, and sharing emotions (Bauer & Erdogan, 2009; Reisinger & Dimanche, 2010). The symbolic value of information, i.e. meaning, is conveyed through interpretation and it is important in order to reach contextually shared understandings (Daft & Lengel, 1986; Miranda & Saunders, 2003; Rigotti & Rocci, 2006; Rogers, 1986). This is important to the process of making sense as to the *why* to perceived experiences and the rationale behind actions (Weick et al., 2005). Dialogue is important, given its potential to provide richer perceptual awareness among team members, support collective learning, and aid in interpreting information (Isaacs, 1993; Schein, 1993; Senge, 2006). This is possible even within strong hierarchal structures when based on equality (Senge, 2006). This is important for convergence, intersubjectivity, and

understanding within collective constellations such as teams. Furthermore, having influence over one's situation has impact on the willingness to participate. Wilson (1995) defines 'participation' in the following way:

> "The involvement of people in planning and controlling significant amount of their own work activities, with sufficient knowledge and power to influence both process and outcomes in order to achieve desirable goals." (ibid, p. 1071)

Other communication theories concern the social effects of media (channels) specifically, their properties, how the media are chosen, and how their consequences and supportive capabilities affect social processes. (e.g. Daft & Lengel, 1986; Dennis et al., 2008; Kock, 2001, 2004; Short et al., 1976). Media Synchronicity Theory (MST) focuses on explaining how media capabilities and their use affect synchronicity of communication, where 'synchronicity' refers to coordinated behavioral patterns (Dennis et al., 2008). A medium's synchronicity is defined as "the extent to which the capabilities of a communication medium enable individuals to achieve synchronicity" (ibid, p. 581). This theory postulates media synchronicity to affect the two central interpersonal communication processes of conveyance and convergence. Conveyance concerns the transfer and subsequent retrospective analysis of raw information (i.e., individual interpretation), while convergence is about attaining meaning and agreeing upon what needs to be done (i.e., creating high-level abstractions and compatible understandings among people, or shared mental models).

The MST is based on the slightly broader theory of media richness (MRT) that describes media's capabilities to 'carry' information and its effects on people's ability to reach a common understanding within a certain time frame (Daft & Lengel, 1986). The theory's main goal is to reduce uncertainty and resolve ambiguity in communication. 'Richer' media have greater capacity to 'carry' information and manage uncertainty and ambiguity. Tasks should be matched to media richness to prevent oversimplification or complication. The theory of social presence (Short et al., 1976) is similar to MRT in certain ways. This theory describes media of communication as having differing social impacts depending on their properties—the degree of acoustic, visual, and physical contact—which allow communicators to have social presence. According to this theory, contact is positively linked to, e.g., intimacy, immediacy, interpersonal connection, and social influence. Thus, extensive text-based interaction (e.g., e-mail, instant messaging, faxing) is less social, decreasing possibilities for social influence.

Media naturalness theory is a theory developed by (Kock, 2001, 2004) that suggests how communication technology is best fitted to the naturally evolved capabilities of human communication. It is a proposed alternative to MRT that propose humans are primarily developed to engage in face-to-face communication. Electronic communication—which is very recent, given in our evolutionary history—is argued

to suppress key elements found in face-to-face meetings, resulting in cognitive communication obstacles, or key elements that seem to be particularly important to complete complex tasks over extended periods of time.

The classifications and models of communication listed in this section help illustrate the range of how communication can be perceived and how its enactment can affect social processes. Dennis et al. (2008) MST model specifically targets the synchronicity of communication capable of being enacted through media and how to match media with the desired communication processes necessary to perform tasks. This is used to understand the impact synchronicity in communication has home care nurses and their social processes.

2.4 Socio-technical theory

Socio-technical theory was proposed in the 1950's and focused on the match between organizations human and technical elements (Trist, 1981; Trist & Bamforth, 1951). The perspective of socio-technical theory presents a way of identifying the world in relation to the three closely related terms *materiality*, *sociomateriality,* and *socio-technical systems*. In the book *Materiality and Organizing: Social Interaction in a Technological World*, Leonardi (2012) distinguishes the three terms in the following way:

> **Materiality**: The arrangement of an artifact's physical and/or digital materials into particular forms that endure across differences in place and time and are important to users. (ibid, p. 42)
>
> **Sociomateriality**: Enactment of a particular set of activities that meld materiality with institutions, norms, discourses, and all other phenomena we typically define as 'social'. (ibid, p. 42)
>
> **Socio-Technical System**: Recognition of a recursive (not simultaneous) shaping of abstract social constructs and a technical infrastructure that includes technology's materiality and people's localized responses to it. (ibid, p. 42)

Materiality goes beyond the physical substance or matter of objects. The concept of materiality advocates that even non-physical and cultural artifacts have physical properties and consequences for how they are used (Lievrouw, 2014). It positions these properties' determination of social relationships and cultural forms (Bollmer, 2015). Leonardi (2010) has argued that "when materiality is understood to represent the practical instantiation and the significance of an artifact, digital artifacts can clearly be seen to have materiality" (ibid.). Thus, digital technologies, even information and its representation, have materiality (Dourish, 2017). All materiality

is argued to be social, as its creation, and the interpretation and use of artifacts take place in and through social processes and contexts, making social action possible.

Sociomateriality is the recognition that materiality takes on meaning and has effects when entangled in social situations (Leonardi, 2012). The entanglement of social and material is proposed to happen when the intentionality of coordinated abilities to form and realize goals (*social agency*) and what materiality allows people to do (*material agency*) become imbricated (Leonardi, 2011). This produce entities called "technology" and "organization".

A socio-technical system is defined as the mutual shaping of social- and technical subsystems in organizations (Leonardi, 2012). The context and conditions of the system can also be referred to as a subsystem; i.e., an environmental subsystem (Trist & Bamforth, 1951). The goal is to achieve joint optimization between the social and technical, seeing people as a resource and encouraging, e.g., collaboration, commitment, and innovation (Trist, 1981).

The perspectives of materiality, sociomateriality, and socio-technical systems are used in this thesis to connect technology use and communication to teamwork and the psychosocial work environment in relation to each other as part of a greater whole. In this thesis, I consider the psychosocial work environment to be part of a socio-technical systems environmental subsystem. Furthermore, teamwork is part of the social subsystem, while technology is part of the technical subsystem.

2.5 Technology adoption and change

There are several theoretical models and perspectives on technology adoption and change, especially among information and communication systems (FakhrHosseini et al., 2024). Two large orientations of research within this field are those of technology utilization (acceptance) and task-technology fit. Research on the first orientation focuses on antecedents of technology use and intention of use, such as attitudes, beliefs, norms, expectation and influence, perception, and intention (e.g. Ajzen, 1991; Ajzen & Fishbein, 1975; Davis, 1989; Davis et al., 1989; Venkatesh & Bala, 2008; Venkatesh & Davis, 2000; Venkatesh et al., 2003). The second orientation focuses on technology's effect on performance and fit with tasks (e.g. Goodhue & Thompson, 1995). Furthermore, combinations of both research orientations exist (Dishaw & Strong, 1999; Zhou et al., 2010).

One of the most influential models on the antecedents of technology use and intentions of use is the technology acceptance model (TAM). The classic TAM model can be said to conceptualize technology acceptance as a six-factor process divided into three stages. The model's first stage encompasses so-called *external variables*. What these variables constitute varies quite widely but can include

descriptions of design features such as the technology characteristics and the implementation process; beliefs, training, and involvement in design among users; and the social influence of technology (Venkatesh & Bala, 2008; Venkatesh & Davis, 1996). The model's second stage—cognitive and affective/emotional responses among the user—is triggered by the model's previous stage. These are comprised of four internal factors seen among users. The cognitive response includes *perceived usefulness* and *perceived ease of use,* which are considered the model's strongest predictors for technology acceptance. Users then experience an affective/emotional comprising of *attitude towards use* and *behavioral intentions* to use the technology (Davis et al., 1989). This leads to the model's third stage—the user's behavioral response—manifested as *actual technology use* (ibid.)

Two other influential theories on technology acceptance and intention of use are the Theory of Reasoned Action and the Theory of Planned Behavior (Ajzen, 1985; Ajzen & Fishbein, 1975). The Theory of Reasoned Action (TRA) is a predecessor of both Theory of Planned Behavior (TPB) and TAM and explains how *attitudes* and *subjective norms* influence *behavioral intentions* and subsequent human *behavior*. TPB extends this perspective by including the influence of *perceived behavioral control* among TRA's components.

The Unified Theory of Acceptance and Use of Technology (UTAUT) combines different theoretical perspectives to form an approach applicable to a wider range of contexts (Venkatesh et al., 2003). The theory suggests behavioral intention to be the determining factor of actual technology use in organizational settings. According to the model, the likelihood of technology adoption depends on the four factors *performance expectancy*, *effort expectancy*, *social influence*, and *facilitating conditions* (ibid.) These are further moderated by age, gender, experience, and voluntariness of use among users. The model was later extended to become more generic and include factors explaining technology acceptance outside organizational settings (Venkatesh et al., 2012).

The Task-Technology Fit (TTF) model is a well-established theory that describe how technology affects work performance and fit with tasks. The theory aims to explain how performance can be impacted by 1) *technology characteristics* (the functionality of technology and data representation), and 2) *task characteristics* (the purpose and requirements of the users' tasks). *Task–technology fit* is the mutual fit that determines how well technology assists the users in performing their tasks. The factor is defined as "correspondence between task requirements, individual abilities, and the functionality of the technology" (Goodhue & Thompson, 1995, p. 218). Task–technology fit in turn influences factors of technology *utilization* and the *performance impact* of users.

A conceptual version of TTF is the Technology-to-Performance Chain (TPC) model (Goodhue & Thompson, 1995). This model has the additional factors of *individual characteristics* and *precursors of utilization*. The individual characteristics describe

the abilities of the user, while precursors of utilization constitute user expectations and the effect of using the technology, social norms, and the conditions of implementation (ibid.).

The variations of TAM are used as a way of describing how and why technologies are adopted in response to perceptual and behavioral factors. This is used to describe why home care nurses experienced the adoption of new technologies during the COVID-19 pandemic and afterwards as useful. The specific TAM provided by Davis (1989) and Davis et al. (1989) was chosen for **Paper V** due to its simpler design, to better enable discussions on the topic from a qualitative research perspective. The TTF model provided by Goodhue and Thompson (1995), on the other hand, is used to describe how characteristics in work and how technology mutually affects utilization. By employing the TAM and TTF models in tandem, insights into how technology use changed among home care nurses, how their usefulness and ease of use were perceived, and their fit with the work situation are gained.

Chapter 3

Methods

This chapter describes, problematizes, and discusses strategies and choices made regarding the research methodology, including the research process, data collection, data analysis, and ethical consideration. I first present the research projects and research process. I then go on to describe my research approach. This will be followed by a description of the methods used during data collection and analysis, respectively. Lastly, methodological and ethical considerations are discussed.

3.1 The research projects and process

The empirical research presented in this thesis was conducted as part of two research projects financed by AFA Insurance. The first research project (Grant DNR: 170278) studied the implementation of a region-wide home care team implementation in Sweden's most southern region—Scania (swe. *Skåne*). General practitioners from Region Skåne's community health centers and nurses from municipal home care would encompass the teams' core and be jointly responsible for caring for patients at home. The aim of the project was to investigate how the work environment for personnel in municipal and homemaker services changed after the team's implementation. The basis for the team implementation was an agreement between Region Skåne and the region's 33 municipalities to develop an interorganizational team structure in each municipality until the end of 2020 (Region Skåne & Kommunförbundet Skåne, 2016). Support was designed to enable appointments for unplanned home visits within two hours and for planned visits within five workdays. The second research project (Grant DNR: 200137) studied the effects of the COVID-19 pandemic on the work environment for municipal home care- and homemaker service personnel. It was an extension of the first research project and was enabled by the pandemic. Both research projects went through ethical vetting and were approved by the Swedish Ethics Review Authority (DNR: 2019-04653, DNR: 2021-00703).

The research process consisted of five data collection periods over the duration of the research projects. The overall research process can be seen in Figure 1. An overview of the appended papers is presented in Table 2.

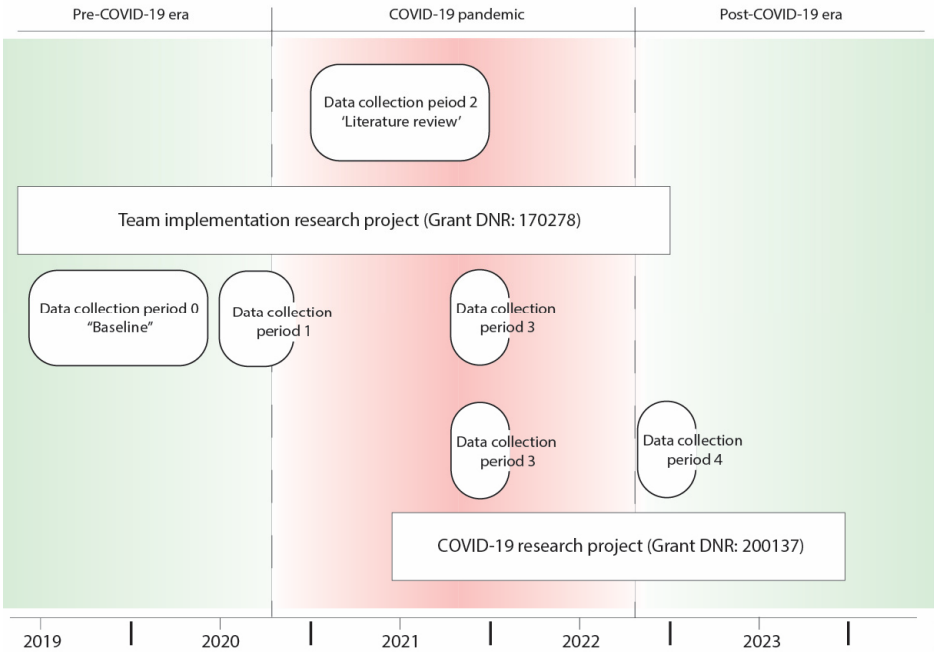


Figure 1. Illustration of the research process.
The research process, projects, data collection periods, and COVID-19 pandemic.

Data collection period 0 investigated the situation of the team's implementation at the end of 2018. Data collected during this period set a baseline for the implementation's future development in four Scanian municipalities. Furthermore, three organizations considered forerunners to the region-wide team implementation were also investigated during this time. Data collected during this period was comprised of interviews.

Data collection period 1 investigated the status of the interorganizational home care team implementation in the four municipalities in early 2020. Data collected during this period were comprised of interviews and field observations. However, data collection was interrupted halfway through the collection period by the COVID-19 pandemic in March 2020. This would prove to be a defining moment that changed the course of the research process—closing access to direct observations with the research field for almost two years. However, thanks to the research group's presence in this context and time, this presented an opportunity to study the effects of COVID-19 as well as the team's implementation.

Table 2. Summary of the five appended papers.
A summary of the five appended papers.

TITLE	RESEARCH QUESTION	DATA	METHODS	ANALYSIS
Paper I: **Teamwork in home care nursing: A scoping literature review**	RQ1. What does existing research say about teamwork in home care from the perspective of registered nurses?	32 scientific papers	Literature review	Thematic analysis
Paper II: **Inter-organizational home care nursing teams: a comparison of a region wide organizational change initiative with success factors identified by forerunners and team theory**	RQ2. What can the failed Scanian-wide implementation of mobile home care teams tell us about existing dynamics between Swedish municipal and regional healthcare?	8 interviews 7 group interviews	Semi-structured interviews *(Face-to-face & telephone)*	Thematic analysis
Paper III: **How digital systems are used in Swedish home care nursing practice: a qualitative interview study to identify challenges and opportunities**	RQ3. What is state-of-the-art of digitalization in home care in relation to its ability to enable/disable communication?	24 interviews 2 group interviews	Semi-structured interviews *(Face-to-face & telephone)*	Qualitative content analysis
Paper IV: **Home care nurses at the heart of the communication web: communication synchronicity and effects on the work environment**	RQ4. How does communication mediation affect the psychosocial work environment among municipal home care nurses?	22 interviews 2 group interviews 10 observations	Semi-structured interviews *(Face-to-face & telephone)* Field observations	Qualitative content analysis
Paper V: **From safety to efficiency: how drivers of technology adoption changed during the COVID-19 pandemic in municipal home care**	RQ5. What did the adoption of novel technologies bring to the 'new normal' in home care nursing practice?	24 interviews 8 observations	Semi-structured interviews *(Telephone)* Field observations	Thematic analysis

Data collection period 2 investigated the scope of current international research on teamwork in home care and role of nurses by conducting a literature review. This data collection period was initiated in direct response to the COVID-19 pandemic

in June 2020 while evaluating future developments. The work consisted of a scoping literature review.

Data collection period 3 investigated the combined development of the team implementation as well as the newly introduced effects of the COVID-19 pandemic in the four included municipalities. Data collection was performed remotely from the field—conducted through telephone interviews in the second quarter of 2021.

Data collection period 4 investigated the status and effects of the COVID-19 pandemic right after it was declassified as a threat to society in April 2022. The research process could be resumed at this point (with caution), as originally planned, with renewed access to the field in the second quarter of 2022. Data included telephone interviews and field observations.

3.2 Research approach

Work Environment Technology is a subject resting on diverse research approaches. It is closely related to the ergonomics (human factors) discipline, as it aims to understand human interaction and other parts of a system for the sake of human well-being and overall system performance (International Ergonomics & Human Factors Association, n.d.). My research approach is qualitative and explorative. The choice to employ an explorative approach to research was based on the fact that home care is generally a relatively unexplored field. Explorative approaches are beneficial when exploring and analyzing topics that are not well-known (Creswell, 2017).

My methodology takes inspiration from ethnography. Ethnographies aim to provide rich insights into people's perspectives, actions, and surroundings by studying social interactions, behaviors, and perceptions within social groups, teams, organizations, and communities (Reeves et al., 2008). Ethnography is the study of human culture, customs, habits, and character—allowing one to study the everyday lives and experiences in a cultural context among individuals and small groups. In other words, it allows the researcher to 'walk in others' shoes', experiencing their reality. Ethnographic fieldwork can last months or years, or can be considerably shorter (Pink & Morgan, 2013). As work is highly mobile and, in this context, bridges contextual boundaries—office environments, public places, patients' homes—a qualitative and ethnographic approach was well-suited to pursuing the research questions.

3.3 Data collection

3.3.1 Scoping literature review

The decision to conduct a literature review was made to understand the international nature of teamwork from the perspective of registered nurses in home care. The review was initiated in direct response to the COVID-19 pandemic, when fieldwork became impossible as the world plunged into uncertainty. The review was a way to let the research process continue. By conducting the review, available literature and future research needs in the field were identified.

Different approaches to conduct literature reviews exist. Literature reviews range between being exploratory to being explanatory. Systemic reviews are explanatory in relation to specific research questions. Scoping reviews, on the other hand, are usually more explorative and intend to "…identify and map the available evidence" (Munn et al., 2018, p. 2). Scoping reviews focus on the "extent, range, and nature of research activity"; i.e., the scope of current research, and "research gaps in the existing literature" (Arksey & O'malley, 2005, p. 21). As the existing studies concerning teamwork in home care nursing were limited in number, I decided to employ a scoping review design. The research design for **Paper I** was inspired by the structured search methodology *Preferred Reporting Items for Systematic reviews and Meta-Analyses* (PRISMA) 2009 (Moher et al., 2009). The process consisted of four steps:

1) Identification—Records were retrieved by searching seven electronic databases. Duplicates were removed after combining the search results.
2) Screening—Record titles and abstracts were screened regarding home care, home healthcare, and nurses' involvement in studies.
3) Eligibility assessment—Full-text articles were retrieved, read, and assessed.
4) Inclusion—The review's set of included literature was described in terms of *aim*, *study design*, *subject (topic/focus)*, and *main results*.

The literature search was carried out on June 3, 2020. The search targeted empirical studies published in scientific journals between June 1, 2010 and June 1, 2020. Studies were collected by systematically searching seven electronic databases including: *Scopus*, *Web of Science*, *PubMed*, *ProQuest*, *EBSCOhost*, *CINAHL,* and *APA PsycInfo*. The review's search strategy was defined in two levels regarding literature titles, keywords, and abstracts. The first level was used to identify studies in the home care context using the following *title* search terms 'home care', 'home healthcare', 'home health care', 'home care nursing', 'home nursing', and 'home health services'. The second level used the search term 'team*' to find studies relating to teamwork in their *titles*, *keywords*, and *abstracts*. Studies were excluded

if they had a patient-oriented focus; covered unregistered home care personnel, nursing homes, or informal or hospital care; did not clearly address teams or teamwork; in cases where study design and methodological descriptions were lacking; and where nurses were not among the main contributors of data. The initial database searches yielded 798 publications. Screening was performed on 383 publications, and 70 were included for full-text assessment. The review process resulted in the final inclusion of 32 empirical studies. The resulting qualitative synthesis gave rise to themes describing the literature's subject and overall content. The theme's prevalence, origin, and methodological combinations of the included literature were also synthesized.

3.3.2 Qualitative data collection

The empirical studies included in this thesis (**Papers II–V**) are qualitative. Their data collection methods constituted of semi-structured interviews and field observations in the form of shadowing (Czarniawska, 2007; Kvale & Brinkmann, 2009). Qualitative content analysis and thematic analysis were used to analyze the datasets. In the following sections, I will give a brief description of these methods and explain why I chose them.

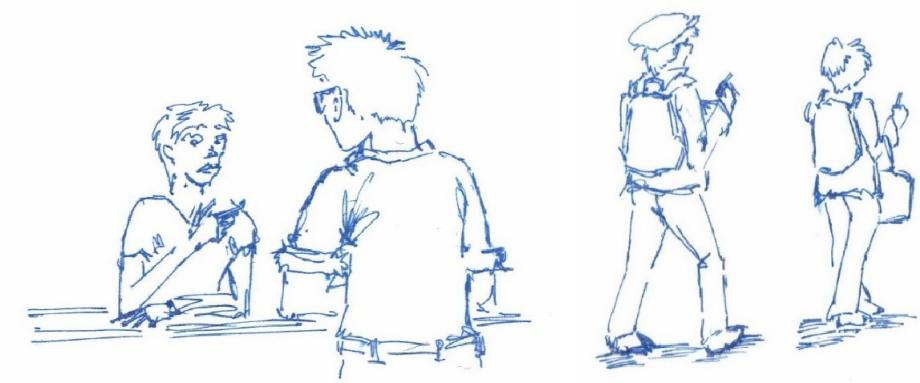


Figure 2. Interviewing and shadowing
Interviewing and shadowing—from the interviewer's/shadow's perspective.

3.3.2.1 Interviews

Interviews were chosen as they allowed for the retrieval of statements to better understand, explain, and explore the opinions, behaviors, experiences, and phenomena in municipal home care nurses' day-to-day work. Interviews offer ways to gain in-depth insight and comprehensive perspectives of informants' points of view through conversation (Kvale & Brinkmann, 2009). Both individual- and group

interviews target individual responses through high levels of interviewer–informant interaction. Individual interviews provide in-depth opinions of each informant in isolation, while group interviews can offer immediate comparisons between informant responses under the influence of group interaction and dynamics (Morgan, 1998). Focus groups are distinguishable from group interviews by stronger informant interaction, which targets group discussion and debate (Brown & Edmunds, 2011).

Interviews can be guided to varying degrees. Structured interviews follow a strict protocol with predefined questions, from which they do not deviate. The interviewer steers the conversation to reassure that interviewees receive the same questions. Unstructured interviews, on the other hand, are set around a broad research question that allows for more open conversation. Here, informants are left to steer the conversation based on their interests. Semi-structured interviews are a combination of the two types, following a protocol with predefined questions but allowing for some deviation (Kvale & Brinkmann, 2009).

The semi-structured interview approach was specifically chosen as a data collection method due to its ability to provide both scientific rigor and flexibility (DeJonckheere & Vaughn, 2019). Stability among informant responses is enabled by following a protocol with predefined questions to support the interviewer, thus contributing to the reliability of the findings. At the same time, flexibility is provided by allowing follow-up questions or replies if needed, thus contributing to mutual control over the conversation. This approach addresses topics of interest for the interviewer rather than asking specific research questions word-for-word, allowing informants to formulate their responses freely around whatever it is they find important to address.

All performed interviews were semi-structured. Protocols with predefined topics and interview questions were created by the research group to guide the conversations for the two research projects. Follow-up questions were asked if needed. Interviews, apart from one, were conducted face-to-face during the period of December 2018–March 2020. From April 2020 onward, telephone interviews were conducted. This was due to the visiting restrictions caused by the COVID-19 pandemic between April 2020 and April 2022. After April 2022, telephone interviews were conducted out of convenience. All interviews were audio-recorded and transcribed.

3.3.3.2 Field observations

Observing people in their real-world contextual settings offers insight into, for example, their activities, behaviors, relationships, and beliefs. Field observations were chosen as they allowed me to gain insight into the nurses' contextual activities and how their work was performed in practice. Observational methods are well-suited to study processes (LeCompte & Schensul, 2010). This method is useful to

get to know unfamiliar and strange environments, and different approaches to observation exist (Rogers, 2012). Direct observations take place in real-time, either on location or via video-recordings of informants and activities taking place. Indirect observations track informants' activities through other sources; e.g., diaries or interaction logs. The researcher's interactive involvement with people and activities can also vary during observations. The researcher can adopt either a participatory or non-participatory role. Even retrospective analysis of video-recorded activities is classified as non-participatory observation. The result from observations is usually written notes produced during or right after field observations. Sketches and ethnographic drawings can be produced as well (Causey, 2017; Emerson et al., 2011).

Shadowing is a non-participatory form of observation. The researcher is visible as an observer but, ideally, does not participate in the events taking place. This approach allows the researcher contextual observation by following objects of study (people or artifacts) in situ during everyday activities (Czarniawska, 2007). Shadowing was specifically chosen as a data collection method, as it allowed me to observe the interactions and activities of the home care nurses which inform their behaviors and beliefs in their real-life contexts (Fetters & Rubinstein, 2019). Furthermore, shadowing is well-suited to the healthcare context since its informants are accustomed to it during training of new healthcare professionals (Kitsis & Goldsammler, 2013).

All performed field observations have been of the shadowing type. I followed home care nurses during their work shifts and observed what they were doing. Most shadowing sessions lasted the nurses´ entire work shifts. One shadowing session was split into two separate sessions due to a switch of the informant being shadowed. Shadowing was conducted between January and March 2020, and was guided by a list of predefined topics. No observations were performed during the period April 2020 to March 2022. Shadowing was later resumed in April to June 2022. A notebook and pen were used for data collection, producing written notes and ethnographic sketches.

3.3.3.3 Ethnographic sketching

Drawing has historically been an important part of the doing of science. The use of sketches was popularized by, e.g., Francesco di Giorgio Martini (1439–1502) and Leonardo Da Vinci (1452–1519) during the 15th century (Kuschnir, 2016). Their function was to support the reasoning given in written testament and better convey ideas through depiction. Sketching in the anthropological discipline originates from the 18th century, as the colonial powers made encyclopedic categorizations of the continents that they conquered. These sketches were mainly used to educate, civilize, and spread knowledge among society's elite (ibid.). Since the establishment of photography and video cameras in the 1960s, sketching is today a relatively rare

way of representing data, except in certain research fields (Heath et al., 2018; Kuschnir, 2016).

Sketching in research has always been very intuitive for me personally. The article format has not allowed me to use them besides as spatial memories and as part of data analysis. That is why they are brought forth here in this thesis. A sketch can be described in the following way:

> "In a sketch, the fieldworker, struck by a vivid sensory impression, describes a scene primarily through detailed imagery…[As] a more distanced observer looking out on a scene… [the writer] describes what she senses, pausing for a moment in recounting the action to create a descriptive snapshot of a character or setting." (Emerson et al., 2011, p. 75)

As Emerson et al. (2011) point out, sketches can likewise be expressed through writing and incorporate other sensual descriptions. Modern anthropological illustrations can vary in style and form based on collected text-based data, from memory or photographs, or observations on site (in situ). The style is highly personal and can vary from rough sketches to highly detailed illustrations.

Drawing adheres to the subjective nature of qualitative research. It can sometimes be difficult to fully reproduce what you see, hear, or feel only through writing. Here, sketching can help to, in addition to words, reproduce and specify details in the environment that are otherwise challenging to express in text without losing some of their meaning. Andrew Causey (2017) makes the following reflection about the method as a way of representing data:

> "[T]here are some things one can capture in words to convey information, some others are best photographed, yet other things are best drawn." (ibid, p. 3)

The observer is given space to express themself in an individualistic way, thus becoming a tool to understanding the surrounding world. Bonnano (n.d.) suggest that the most central contribution to expressing oneself through self-produced drawings is not so much about representing reality in its true form, but rather resembling reality in the way we experience and understand it. The potential of sketching is described by Tim Ingold to "reconnect observation and description with moments of improvisatory practice" (Ingold, 2011, p. 2), and by Carol Hendrickson as a "visual process of coming-to-know" (Hendrickson, 2008, p. 120). For me personally, sketching has been a way of making sense of what I observe. Thus, a sketch becomes an early interpretation of data close in time to the event that take place. Like contextual markers, they position information in a frame of time and space that the written notes provide. As such, they are '*spatial memories*' of my observations and are important, as they recreate the conditions and feeling present at the time of observation.

The intrinsic meaning of a sketch is inseparable from the events during which it was created—in which it is seen, remembered, and expressed (Berger, 2007). The relationship between reality and truth is in constant tension (Van Wolputte, 2017). Reality refers to facts, truth to life experience. Furthermore, the act of sketching is, according to John Berger (2017), a process of "seeing" where the process is more important than the outcome; i.e., the final sketch. A handmade sketch, drawing, or illustration is thus a conversation with what is depicted and not just a depiction of reality.

3.3.4 Qualitative data analysis

There are different approaches to qualitative data analysis, and they can be put on a spectrum. On one side, it can be a deductive, or 'top-down', approach where theory and predetermined codes are applied to empirical data (Alvesson & Sköldberg, 2008). On the other side, it can be inductive—i.e., a 'bottom-up' —strategy, where data are not subjected to theoretical preconceptions or limitations (ibid.). In short, deduction is theoretically driven while induction is empirically driven (ibid.). When characteristics of both a deductive and inductive approach are at play, it is abductive (Alvesson & Sköldberg, 2008; Graneheim et al., 2017). Abduction is a distinct approach based on empirical facts, without the rejection of theoretical preconceptions (Alvesson & Sköldberg, 2008). My approach to qualitative data analysis has been closer to the inductive end of the spectrum, allowing the data to 'show the way'; i.e., to guide the analysis process. However, as with any true reasoning, elements of both deduction and induction have been present. My research's analytical approach has, therefore, been abductive. The terms 'content analysis' and 'thematic analysis' are sometimes used interchangeably. In this thesis, however, I have chosen to differentiate between the two.

3.3.4.1 Content analysis

The datasets for **Papers III–IV** were analyzed using qualitative content analysis methods in QSR NVivo 14©. An inductive approach to qualitative content analysis was chosen due to the research's descriptive and explorative nature (Elo & Kyngäs, 2008; Silverman, 2014; Thomas, 2006; Vaismoradi et al., 2013).

The term 'content analysis' is often used in a conceptually wide sense. Its meaning is therefore not always easily or clearly defined. Patton describes content analysis to be used "…to refer to any qualitative data reduction and sense-making effort that takes a volume of qualitative material and attempts to identify core consistencies and meanings." (Patton, 2002, p. 453). Vaismorandi et al. (2013) synthesizes content analysis based on several authors (Grbich, 2013; Mayring, 2000; Pope et al., 2006), as:

> "[A] systematic coding and categorizing approach used for exploring large amounts of textual information unobtrusively to determine trends and patterns of words used, their frequency, their relationships, and the structures and discourses of communication…" (Vaismoradi et al., 2013, p. 400)

As part of the coding procedure, labels or 'codes' are given to the data being systematically analyzed. As codes accumulate and are ordered in terms of their relationships, key *categories* are identified in the dataset. Here, a 'category' refers to "a collection of similar data sorted into the same place…enabl[ing] the researchers to identify and describe the characteristics of the category" (Morse, 2008, p. 727). Categories can be compared to one another as they are identified and defined, even being further divided if their scopes are broad (ibid.).

The interview transcripts and fieldnotes were coded with no a priori codebook or theoretical framework. I played a revising role in the analytic process in **Paper III** where I offered input and suggested changes to the work made by the main author. The codes were analyzed after data clusters were made or found useful to describe the home care nurses' work setting. For the analytic process for **Paper IV**, I had the main role. I chose to focus on the mediation of communication after it was found to be a dominant factor in home care nurses' work. The content analysis for both papers focuses on the manifest content of the interview transcripts and fieldnotes (Graneheim & Lundman, 2004).

3.3.4.2 Thematic analysis

The dataset for **Papers I, II,** and **V** were analyzed using thematic analysis using QSR NVivo 14©. The approach for the appended papers in this thesis was inspired by the popular framework provided by Braun & Clarke (2006). In their publication, thematic analysis is defined in its broadest sense:

> "[A] method for identifying, analyzing, and reporting patterns (themes) within data." (ibid, p. 79)

Despite its wide use in qualitative research, agreement on its definition and execution varies. What can be said, however, is that while content analysis structures datasets through coding and categorization, thematic analysis goes one step further and delves deeper into the meaning of the datasets' content.

Two competing ideas on how 'a theme' is conceptualized exist. In the "*domain summary*" conceptualization, a theme "*summarizes* what participants said in relation to a topic or issue, typically at the *semantic* or surface level of meaning, and usually reports multiple or even contradictory meaning-content" (Braun et al., 2019, p. 846). The "*shared meaning-based pattern*" conceptualization refers to "a *pattern* of shared meaning, organized around a core concept or idea, a central organizing concept" (ibid, p. 845). Ibid. provide the following description based on (DeSantis & Ugarriza, 2000):

> "In [shared meaning-based pattern] conceptualization, themes capture the essence and spread of meaning; they unite data that might otherwise appear disparate, or meaning that occurs in multiple and varied contexts; they (often) explain large portions of a dataset; they are often abstract entities or ideas, capturing implicit ideas 'beneath the surface' of the data, but can also capture more explicit and concrete meaning; and they are built from smaller meaning units (codes)…" (Braun et al., 2019, p. 845)

A theme is thus the meaningful essence running through the data, the basic overall topic on which the narrative is about (Morse, 2008). Thematic analysis also varies based on seeing 'themes' as either analytic *input* or *output*. As analytic input themes are "patterns identified and developed at the *start* of the analytic process (usually following some data familiarization) which guide the data coding process" (ibid, p. 846). As analytic output, themes are "patterns identified and developed *later* in the analytic process, building on, and representing the *outcome* of, coding" (ibid, p. 846–847).

The analyses for **Papers I** and **V** adhere to the "shared meaning" conceptualization of themes where they are the output of the analytic process. Both papers had a thematic analysis approach throughout. Part of the analytics of **Paper I** can be argued to have been thematically analyzed based on the review's included literature. I had a revising role in the analytic process of **Paper II**. For the analytic process of **Paper I**, I was a co-author. I was also the main analyst in **Paper V**.

3.3.4.3 Theoretical analysis

As part of **Paper IV**'s analytic process, the dataset was subjected to analysis using two theoretical frameworks. This was done after finishing the coding and categorization of the interview quotes and field observation notes. The categories from the qualitative content analysis were first analyzed from the perspective of media synchronicity (Dennis et al., 2008). The same categories were then subjected to analysis from the perspective of job demands, decision latitude (control), and support at work (Karasek & Theorell, 1990). Then, this analysis was exemplified by showcasing characteristic quotes from the interviews and field observation notes. The theoretical analysis from these frameworks focuses on the interview transcripts' and fieldnotes' latent content as interpretations are made (Graneheim & Lundman, 2004).

3.4 Methodological considerations

The COVID-19 pandemic fundamentally changed the conditions of conducting research for this thesis. The visiting restrictions that were introduced in healthcare made it impossible to gain access to the field for almost two years. Home care was

especially problematic to access, as it cared for society's most vulnerable patient group during the pandemic, and the ability to provide barrier care in the patients' homes was limited. It was necessary to cease all direct interaction with the research field. Field observations proved impossible to conduct. Interviews were still possible to conduct, however they could not be conducted face-to-face. The abrupt change in conditions and the length of these changes impeded possibilities to choose what data to collect and how data could be collected. However, the actions taken were necessary. No research is worth the cost of a life or someone falling ill.

On a more positive note, the mere existence of the first research project gave rise to the second and a rare opportunity to gain insight into a sector under great pressure that, prior to the pandemic, had not been given much attention in Sweden.

When collecting data, informants can alter their behavior to match what they think researchers are looking for, or want them to say or do. This is commonly referred to as the "Hawthorne effect" (McCambridge et al., 2014; Wickström & Bendix, 2000). Here I have had to be aware off the possible effects my presence could have had as a researcher while interviewing and shadowing. Over the course of data collection, I made it clear to informants that I did not want them to answer or do things in a particular way. I asked them to give *their* opinion and do as *they* do usually.

The methods used for data collection were deliberately chosen to obtain method triangulation. Triangulation refers to the use of two or more methods/perspectives to study a phenomenon and is important in qualitative research. Combining interviews and field observations makes it possible to strengthen findings from either method while simultaneously mitigating their respective weaknesses. Shadowing helped me gain answers to *what* and *how* home care nurses did at work and *where* they did it. The interviews provided a chance to gain possible explanations as to *why*. The process has been time consuming, and large quantities of data have been collected. It is important to immerse oneself in qualitative research. Field studies are as much about spending time with individuals in the local context to see their actions on events in everyday life, as it is about the researcher's own experiences as a field observer on the same events and circumstances (Emerson et al., 2011). As such, the researcher is an important instrument for both data collection and analysis. However, this opens up the critique that interpretations of the data are based on my personal interests or subjective perspective. However, decisions made on which methods to use and the fidelity of findings have been scrutinized in ongoing dialogues with the research group and my supervisors throughout data collection and analysis.

3.5 Ethical considerations

Ethical risks and problem areas are prominent in qualitative research and important to manage. The ethical dimension in my research is prominent both in terms of its purpose, the way research is conducted, and how results are presented. Humans are at the center of the research, and informants' rights need to be respected regardless of the method employed in data collection and analysis.

Literature reviews on ethical dimensions of interviews have identified several areas of concern. Challenges exist in maintaining the privacy and consent of informants when exploring unexpected areas (Allmark et al., 2009). The flexibility of semi-structured interviews can make it difficult to provide informants complete information in advance as to what exactly the interviews will address (ibid.). Informants should be provided anonymity, voluntary participation and chances for participation withdrawal, safeguarded privacy, confidentiality, and avoidance of research result misuse (Nii Laryeafio & Ogbewe, 2023).

Observations are associated with several potential ethical problem areas (Bartkowiak-Theron & Robyn Sappey, 2012; Johnson, 2014; Swedish Research Council, 2017) Shadowing can be associated with ambiguous ethical conditions. One cannot know for sure which observation informants or situations one will encounter in advance, so ethical and moral decisions may have to be made in the moment (Czarniawska, 2007; Ferguson, 2016). Much depends on the individual researchers discipline and intuition in the field; on data collection and analysis; and when reporting results, complying with good ethical practices (Bartkowiak-Theron & Robyn Sappey, 2012). Prior to my enrolment as a PhD student, I worked for four years as an hourly paid nursing assistant at a municipal housing for the aged. During my time there I experienced situations and dilemmas present in municipal care work. Thus, my experiences as a nursing assistant have guided me in the ethical considerations necessary in this setting.

Both research projects were ethically approved by the Swedish Ethics Review Authority (DNR: 2019-04653, DNR: 2021-00703). I actively partook in writing and discussing the vetting documents with the others in the research group. Ethical vetting was considered necessary, since shadowing meant that I would follow the home care nurses during home visits, thus intruding on the living quarters of patients. The home is a special and protected place of privacy for the patients. The environment is one person's workplace, but also another's home. As Ferguson (2016) describes, it can be difficult to know in advance who and what situations will be encountered during shadowing. It is also difficult to know what direction contextual conversations or interviews may take, who initiates what, or why (Allmark et al., 2009; Ferguson, 2016).

Existing advice and guidelines for good research ethics have been followed (European Commission: Directorate-General for Research and Innovation, 2010;

Swedish Research Council, 2017). However, the qualitative researcher should also strive to develop the ability to perceive and assess their practical wisdom, or phronesis (Brinkmann & Kvale, 2005). As Birch et al. (2012) put it:

> "...[R]esearchers need to invoke contextualized reasoning and not just appeal to abstract rules and principles" (ibid, p. 7)

Informed consent was obtained in writing from the nurses interviewed or shadowed before any form of data collection began. Information about the data collection and projects were given with contact information to the research group. The nurses had the right to withdraw at any time, without giving any reason. I was continuously observant during interviews on how conversations with informants felt. I chose during shadowing to engage in continuous interaction and consensus with my informants to perceive that consent was maintained. Information forms for indirectly affected persons were always brought along during shadowing. Like Ferguson (2016), I have experienced things during the field studies that I cannot share. For example, these can include topics of conversation that have been kept confidential between me and my informants. I sometimes encountered situations and lives stories in the field that I feel I do not want to pass on. And even in moments when I had permission from the profession, but it did not feel right to enter a home, I have chosen not to go further than the hallway.

There are clear conflicts of interest to consider in qualitative research. For example, as ibid. experienced, it is important to be aware that the research subjects have (and should have) control over data collection and what information is conveyed. At the same time, he expresses that researchers have control over the results. Personally, I would add that we as researchers also have control over data analysis, and by extension, the results. Qualitative research involves the presence of interpretations, nuances, and perspectives. True objectivity as in quantitative research is elusive, and possibly even an illusion (Fine, 1993). Here, method triangulation is important to create a more reliable basis for interpretation.

All in all, the research field of Work Environment Technology is strongly associated with ethics and risk. Great emphasis is placed on the researcher's ability to act on the basis of good ethics and morals in planning and preparation for fieldwork, in the field, during analysis, and finally in how results are presented and managed. Continuous consent from research subjects in combination with the researcher's self-awareness, reflexivity, and a capacity for ethical mindfulness; "a constant alertness to, and engagement with, ethical dilemmas, an ethics in practice..." (Warin, 2011, p. 809) are stated as being preventive of ethical dilemmas in qualitative research (Taquette & Borges da Matta Souza, 2022).

Chapter 4

Summary of appended papers

This chapter presents a summary of the five appended papers in this thesis. At the time of writing, four of the papers are published and one is submitted for publication in a scientific journal. The title of each paper is presented, followed by a description of the aim, a brief mention of the methods, and a summary of the most important research findings. An outline is presented under the heading "Appended papers" at the beginning of the thesis as to where in the submission process each of the five papers are, together with my contributions to each of the research papers.

4.1 Paper I

Teamwork in home care nursing: a scoping literature review

The overall aim of this paper was to explore current literature to gain insight into teamwork in home care nursing. More specifically, the paper intended to describe the scope of current literature from the perspective of focus, the methodologies used, and to identify needs for future research.

The results from the review show most of the included studies originating from Northern- and Western European and North American countries with considerable variations in their study design and quality. The use of qualitative methods was prevalent in data collection, as were the use of stand-alone methodologies. Multiple methodological approaches and ethnographic field studies were rare, making the use of method triangulation and thick case descriptions largely missing. Few studies apply methods suitable to capture the complex nature of teamwork.

The literature has discrepancies in its terminological definitions, distinctions, and contextual descriptions. Team definitions are often lacking, they are not always clearly described, and are sometimes not even present. The distinction between home healthcare and home care nursing is not clearly defined. The literature often describes teamwork, but seldom theorizes it. Contextual descriptions are shallow and seldom contribute enough insight to understand the dynamics or organization of work of the specific healthcare system under study. Descriptions of the

composition of professions and their task distribution in teams are not always clearly provided. However, teamwork in home care is portrayed as being important throughout and consistently considered good and desirable.

The results identify eight themes in focus in the literature. It is most common for studies to focus on how teamwork is used to *target specific tasks or problems*. The home care nurse clearly plays a central and critical role in teams of this context. However, a common observation here is for studies to focus more on managing the task or problem itself rather than on what teamwork brings to practice overall. The second most common theme was for studies to *describe specific teamwork characteristics*. These two most identified themes tend to be narrow and give too little attention to the broader context of teamwork. Richer descriptions are important to ensure the determination of relatability of the findings to other cases.

The results address the relational nature of teamwork in home care nursing. The need to enhance familiarity and collaboration between team members is clear among the included literature. Relationships within teams are essential, and home care nurses are central in managing and sustaining those relationships. As familiarity within the team increases so do possibilities to share experiences, information, and build relationships, trust, common goals, and team coherency, which in turn can create opportunities for *organizational learning* and *change* when in line with the professionals' work situation. Several studies portray nurses as being situated at the very core of teamwork, holding care together, and having care coordination responsibilities. Simultaneously, as physicians may be hard to reach or even absent, home care nurses need to be more independent and adopt characteristics otherwise associated with physicians in other settings.

The least common foci of studies are *team skills*, and teamwork's *relationship with the work environment* and *digitalization*. Autonomy and self-direction are important to home care nurses and the review address teamwork as a source of control and support at work. Furthermore, the review address digitalization of home care nursing in relation to teamwork to be under-researched, despite the ongoing trend of digitalization in healthcare and in society at large.

The topic of teamwork in home care nursing is a limited research field. More research is needed overall, but especially on team skills, the effects of teamwork on the work environment, and the relationship between digitalization and teamwork. Furthermore, future research needs to provide richer descriptions of context and be more explicit as to how 'team' and 'teamwork' are defined and used.

However, the findings of **Paper I** address existing literature elevating the relational nature of teamwork in home care as well as registered nurses' important role. Building relationships is important for teamwork to function. The literature considers it important for organizations to allocate time and resources, and lower boarders to allow professionals to fluidly interact and collaborate. Common ground needs to be established and roles and contributions among members clarified.

Member familiarity—i.e., group stability—is important for relationships and other factors to develop. Here nurses are often situated at the very core of teamwork, holding it together. The findings of **Paper I** also address literature indicating that teamwork can be a source of control and support for nurses' work environment.

4.2 Paper II

Interorganizational home care nursing teams: a comparison of a region wide organizational change initiative with success factors identified by forerunners and team theory

The aim of this paper was to compare results from a large region-wide implementation intended to foster interorganizational mobile teamwork between municipal home care nurses and general practitioners employed by the region at community health centers, with success factors identified by forerunners who had already implemented this type of teamwork on a smaller scale and with contemporary team theory. Interviews were used, and notes and transcripts were subjected to thematic analysis to achieve this aim.

Three success factors were identified among the forerunner organizations concerning interorganizational teamwork between the home care nurses and general practitioners: *fixed doctors assigned to the team*, *co-location of staff*, and *a shared team identity*. However, few of these success factors were present among those studied in the four municipalities undergoing the change initiative. Three themes were identified describing how the change was perceived in practice: *initiative not living up to expectations, divided responsibility*, and *existing structures are the key to success*.

A widespread view existed among the municipal home care nursing organizations that the interorganizational teamwork initiative did not live up to expectations, despite two years having passed into the implementation process upon the initiation of data collection. Expectations on increased continuity in nurse–doctor relationships were not felt to be fulfilled, and not much practical positive change was found when it came time for patients to be enrolled. It was clear to the municipalities that lacking resources at community health centers affected the teamwork negatively. A large discrepancy seemed to exist between what was promised and agreed upon at higher organizational levels and the actual circumstances under which work was performed in practice. Community health centers did not feel that the region had provided enough resources to fulfil their part of the agreement. To fix the intervention, the region introduced a back-up team at a hospital available to some municipalities. This addressed the availability of doctors to home care nurses, but resulted in decreased team stability.

Community health centers were clear regarding the municipalities' personnel provision responsibility for the team up to the level of registered nurse. Their responsibility was to provide general practitioners. However, at the same time, one of the municipalities pointed out that the responsibility for the team, in fact, lay with the region and community health center together. For one thing, the general practitioner had the power to decide which patients to enroll. The general practitioner also had final say regarding whether there was to be any home visit for a patient at all when the municipal nurses asked for it. Furthermore, much of the preparation work related to patient enrollment was conducted by municipal nurses. Thus, overall team responsibility seemed to be missing. The division of responsibilities was strict and the 'team' was not seen as a joint organizational entity to which the home care nurses and general practitioners identified themselves. Thus, while forerunners had aimed for an interdisciplinary approach, the studied initiative in the four municipalities appeared to instead target a multidisciplinary approach.

Figure 3. 'The act' and 'the audience'
A meeting in a patient's home environment. Attending participants from the left: general practitioner (community health center), patient, care manager (social services), nurse (municipal home care), and the patient's relatives (child and grandchild).

Municipalities highlighted the importance of having a dedicated general practitioner at community health center working with the nurses. This structure existed in two of the municipalities. However, this was nothing new; not something that had been introduced as part of the change initiative but rather something that had been going on for years and had been organized by the municipalities and community health centers themselves. These organizations therefore had intentions to establish relationships and agreement on effective ways of working together, which is important to become an effective team. The interorganizational change initiative

involves two types of organizations with different priorities and responsibilities, making it important to find ways to make teamwork 'make sense' on both sides on the local level to come together under one team identity.

4.3 Paper III

How digital systems are used in Swedish home care nursing practice: a qualitative interview study to identify challenges and opportunities

The aim of this article was to provide an up-to-date description of how digital technology is used (or not used) in the daily practice of Swedish home care nurses and presents challenges and opportunities for the next iteration of home care nursing digitalization. Interviews were used, where transcripts were subjected to qualitative content analysis and related to team theory to achieve this aim.

The results showcase Swedish home care nurses acting in an overlapping setting interacting with (at a minimum) homemaker services, social services, rehabilitation, community health centers, housing for the aged, hospital departments, emergency care teams, and pharmacies. Apart from actual care work, a large part of home care nurses' work was dedicated to synchronous and asynchronous communication and information exchange. Day-time work shifts started in the office where activities of the day are planned and prepared. The home care nurses then left the office and performed all scheduled home visits before lunch, with several visits performed in a row. Afternoons were dedicated to administrative tasks at the office but could be interrupted by critical situations that could, on occasion, need to be addressed right away, including unscheduled home visits. The nurses were found to be dependent on both hardware and software throughout their workdays. As their technological 'toolbox' increased, it required them to make daily decisions on what to bring (or not to bring) into the field.

The results identify four areas of challenges and opportunities relating to digitalization and the home care nurses' use of technology. The first and second area was *accessing information and documenting in the field*. Home care nurses expressed it as cumbersome to carry and start up portable technology such as laptops in combination with unstable internet connections in the field. The nurses instead found other ways to access information—e.g., asking colleagues over the phone. Thresholds for bringing digital systems into the field were surpassed when their use was considered sufficiently meaningful, perceived to be useful, fit the task at hand, or was demanded. Patient- and task information were kept track of either by memory or on pieces of paper. Information that is gathered exceeded that needed for documentation, meaning that a need still exists for follow-up at the office even if EHR's are made accessible in the field. Furthermore, risks exist, such as having

information on pieces of paper, as they can be lost, and patient information could be violated. Making information sharable (or not sharable) and systems more easily accessible in the field (easier to bring, quicker to access, easier to use, complement absence of colleagues, supporting nurses in care situations, and preparing/keeping track of tasks and temporary information), and new technologies and their routines could be better integrated into daily practice and better match nurses' mental models of managing work and information.

A third area identified concerns regarding *communicating with others* which was found to be a highly central part of home care nurses' work, yet a potential source of inefficiency and disturbance. Challenges identified relate to the myriad of media and routines used for communication (which were sometimes unclear), where the home care nurse must be adaptable for the communication of others. Furthermore, communication can be indirect or even absent, which results in nurses spending time following up loose ends. Opportunities for development include providing better support for two-way communication so that no one is left not knowing whether the other side has received or acted on information, as well as reducing complexity by standardizing or making better use of existing media instead of introducing new ones. These findings are further explored in **Paper IV**.

Figure 4a-b. A diverse work setting
Work of home care nurses constitute settings in (a) office environments and (b) in and between home visits.

The fourth area identified was *increased complexity due to digitalization*. Digitalization transforms healthcare practice. However, the digitalization that had taken place in the studied organizations had not transformed the organization of the nurses' daily practice to a significant degree. Digital technology available to the home care nurses was considered a natural part of their daily work and was not something they usually reflected upon. They are necessary for work and considered to offer relevant functionality. However, the technology and its seemingly low maturity offered a functionality not completely developed for home care nurses'

needs to perform their tasks and were prone to basic usability problems. Technology wasn't as supportive as it could be, and tasks, when digitalized, were often not fully completed. When the functionality of technology did not support the tasks completely, old routines were kept in parallel to (fully or partly) complete the task. This becomes a problem as digitalization increases. The overall work situation can become more complex, leading to work fragmentation, decreased standardization in task performance., inefficiency, and increased work complexity. Furthermore, the basic usability problems exhibited in home care nurses' use of technology can affect their work environment negatively. At the same time, these consequences of new digital systems for daily work are often overlooked. Opportunities identified were to employ methods for easier system use and digital work environment evaluation, viewing digitalization as an ongoing process, and to improve procurement processes considering high usability and user experiences.

4.4 Paper IV

Home care nurses at the heart of the communication web: communication synchronicity and effects on the work environment

The aim of this paper was to: 1) explore the communication practice of home care nurses, 2) investigate how the type of communication media and its synchronicity influences nurses' communication practices, and 3) investigate how their psychosocial work environment was affected by the media choice. Interviews and field observations, resulting in transcripts and notes, were subjected to qualitative content analysis. These findings were then analyzed using JDCS and MST models to relate the home care nurses' experienced work demands, control, and support in regard to communication synchronicity. This paper extends the findings of **Paper III**.

The results show that home care nurses engage in a complex communication practice at work. Each nurse manages an interprofessional and interorganizational communication network, metaphorically referred to as a 'web'. Media allowed three types of communication to be enacted: oral, written, and visual. Synchronous communication—i.e., communication with high synchronicity—was found to be important in this context, as it helped home care nurses obtain and provide control and support when working together with others. This was commonly provided in oral communication via face-to-face meetings, making regular status updates possible. Phone calls were a medium which enabled oral communication at a distance. Despite demanding nurses to be available to provide control and support to others, the benefits often outweigh the potential costs. Communication through writing was found to be both dominant and diverse, while visual communication

was represented by the use of photographs, and both were used to convey information. Both could be a source of increased control and support. The 'web' was found to have a protective function for the nurses if media matched the required communication processes to solve tasks and act upon their work situation with others. However, the web's supportive function required maintenance work, and the nurses had limited room to influence their media use due to routines, the information's confidentiality, and potential delayed responses from others. This introduced pressure and put demands on the home care nurses to mantle the role as a driving force for communication, although this also was something they found attractive in their work.

Figure 5a-b. Social interactions and communication synchronicity.
(a) A morning meeting with the homemaker service group. (b) Reaching out to community health center – leaving message.

Chances to engage in convergent interactions occurred more frequently in the municipal work setting and during home visits than elsewhere. When it came to crossing organizational boundaries, interactions better supported the process of conveyance than convergence due to the dominant use of written communication across this interface. Asynchronous communication was enforced when communicating with other healthcare organizations, reducing the nurses' control over their work. However, when possible, nurses could also arrange their communication practice to gain control towards other professional groups. This could be by either enabling or disabling possibilities for interactive communication. Thus, groups were engaged in a local optimization practice where optimization for one group could come at the cost of others. The paper concludes that communication practice should be designed holistically, where synchronous communication should be better facilitated across organizations to better foster the development of teamwork and a healthy psychosocial work environment.

4.5 Paper V

From safety to efficiency: how drivers of technology adoption changed during the COVID-19 pandemic in municipal home care

The aim of this paper was to investigate the introduction, adoption, and use of new digital technologies into practice among registered nurses in Swedish municipal home care during the COVID-19 pandemic. More specifically, the changing roles of technology in practice and its effects on the nurses' work environment was followed over time. Interviews and field observations, resulting in transcripts, notes, and sketches, were later subjected to thematic analysis and used to achieve this goal. The findings were later related to the TAM and TTF theoretical models to identify and discuss factors associated with technology acceptance, use, and fit with work. This paper extends the findings of **Papers III–IV**.

The results pinpoint the essential role technology had for the continued provision of home care during the COVID-19 pandemic. Two main themes were found that describe how drivers behind technology use, both pre-existing and new, changed over time. The utilization of technologies—again both pre-existing and new—allowed home care nurses to adapt their work to evolving conditions and needs. The main driver among home care nurses' technology use throughout the pandemic was the need to *ensure safety*. Social distancing prohibited physical meetings from taking place except in small, isolated work groups. However, the need for interaction and coordination remained. Thus, technology-mediated interactions increased. Adaptations to technology use stemmed from a desire to keep work and performance as close as possible to 'the old normal', preserving task characteristics when possible, and were not intended to increase the nurses' workload during the strained situation. Pre-existing technologies such as phone calls, e-mail, and faxing became more utilized, stepping in and filling gaps created by the need for information exchange and communication. However, work was required to change when the capabilities of the pre-existing technologies could not meet the novel needs presented by the demands for safety and social distancing.

Three totally new technologies for this context were introduced as a direct response to the COVID-19 pandemic: *infection status lists*, *digital faxing*, and *digital meetings*. Infection status lists were online sharable lists used for collective overview of the spread of infection among home care nurses' patients. The lists were created and managed by the home care nurses outside municipal EHRs, containing information about patients in relation to COVID-19. The digital fax, also called the 'e-fax', was a digital counterpart to the preexisting physical fax machine used via home care nurses' e-mail clients. Two municipalities had implemented this technology to free communication from the office to enable communication with, e.g., regional healthcare to be continued from home during sick leave or during the

care of sick children, alleviating the workload for those who were healthy and working at the office. Digital meetings and video conferencing were used as a substitute for gatherings in larger groups, enabling higher levels of synchronous social interaction. The new technologies contributed to enabling social interaction during the time when social distancing, directives, and routines were required to ensure safety. However, a second motivator progressively emerged as the nurses started to use their new technologies and experienced potential benefits: *striving for efficiency*. This introduced new intentions and expectations among nurses on their potential future use, which would coexist with the original intent for safety until the society opened to 'the new normal' in 2022.

Figure 6. A social gathering through technology.
An in situ sketch depicting home care nurses attending a digital meeting (lecture) with regional healthcare through a laptop and a big screen TV.

The three new technologies would meet three different fates. The infection status lists were abandoned, digital faxes continued in use where it had been implemented, and digital meetings continued in use in certain situations, since they could improve nurses' efficiency. With the main driver of ensuring safety gone, pre-existing technologies' use returned mostly to 'old normal' standards, while the new technologies use was based on the fit between their perceived usefulness and the nurses' 'new' work situation. This suggests that contextual feedback and experience are important to technology acceptance. However, technology adoption was not only a matter of perceived usefulness but also a matter of organizational factors and decisions. The sudden disappearance of the infection status lists could result from decreased perceptions of usefulness or secrecy issues returning under the 'new normal' circumstances. Digital faxing continued despite being associated with usability problems, as its predecessor had been decommissioned. Digital meetings continued as a complement to physical face-to-face meetings, although with vigilance to its effects on future interactions. Thus, utilization and performance impact may not be good predictors of beneficial work conditions. The utility of technology can be good or bad, and when usability problems exist in combination

with necessary use, it forces use onto nurses. Technology acceptance, fit with work, and user experience have important effects on performance and wellbeing. Furthermore, nurses' combined experience and perceptions of technology use and interactions, prior to and during the pandemic, effects the potential future utility of new technology and work in practice.

Chapter 5

Discussion

In the following chapter, I return to the five research questions introduced in chapter 1. The answers to these questions are provided by the findings of the appended papers summarized in chapter 4. I will then heighten the discussion by connecting the thesis results from the perspective of socio-technical theory. Finally, I present the thesis' empirical, theoretical, and methodological contributions.

5.1 Returning to the research questions

The aim of this thesis has been to investigate Swedish home care nurses' working environment with emphasis on teamwork, communication, and technology use. The thesis research questions (RQs) are as follows:

> *RQ1. What does existing research say about teamwork in home care from the perspective of registered nurses?*
>
> *RQ2. What can the failed Scanian-wide implementation of mobile home care teams tell us about the existing dynamics between Swedish municipal and regional healthcare?*
>
> *RQ3. What is state-of-the-art of digitalization in home care in relation to its ability to enable/disable communication?*
>
> *RQ4. How does communication mediation affect the psychosocial work environment among municipal home care nurses?*
>
> *RQ5. What did the adoption of novel technologies bring to the 'new normal' home care nursing practice?*

Paper I explores the scientific literature's scope on teamwork in home care nursing, showing that research on teamwork from the perspective of the work environment and technology use in home care nursing is under-researched. **Paper II** shows that the region-wide team implementation intended to foster interorganizational teamwork in Scania failed when success factors compared to forerunner organizations and team theory were missing. **Paper III** shows the overall structure of Swedish home care nurses' daily work and areas where challenges and

opportunities exist for further digitalization of home care. **Paper IV** shows that communication has a significant effect on nurses' psychosocial work environment in home care, but that they experience problems communicating with regional healthcare. **Paper V** shows the significant role technology played for home care nurses in adapting their work during the COVID-19 pandemic and the fate of three new technologies introduced during this time.

The answer to each research question is, to a large degree, correlated to the findings of the correspondingly numbered papers, yet there is some overlap. Specifically, findings from **Paper I** mainly contribute to answer RQ1; **Papers I–II** contribute to answer RQ2; **Papers III–IV** contribute to answer RQ3; **Paper IV** mainly contributes to answer RQ4; and **Paper V** mainly contributes to answering RQ5. In the following sections, I will first discuss the results from the perspective of each research question. I will then discuss and analyze the findings of the thesis research from the perspective of socio-technical theory presented in chapter 3.

5.1.1 What does existing research say about teamwork in home care from the perspective of nurses?

From an empirical point of view, it is clear that teamwork is considered important in home care internationally and is framed as something positive like in healthcare en masse (Larsson et al., 2022). The focus among international literature scope has a strong but narrow emphasis on engaging in teamwork to target specific tasks, problems, or patient groups. It is natural to emphasize an engagement in teamwork to achieve, e.g., higher efficiency and care quality, as the core goal of care practices is to promote patient benefits. This resonates well with research focusing on teamwork functionality (e.g. Rosen et al., 2018; Salas et al., 2000).

However, research in this field has several discrepancies. As in healthcare overall, teamwork is often assumed to be 'good'. Home care is a distinct healthcare field governed by its own distinct circumstances and dynamics, brought about by the high variability in organizational structure, scope of delivery, and jurisdictional governance. Thus, to generalize research findings from other healthcare settings into home care may not be adequate, as the contextual overlaps in its environment make it more complex.

The literature's seldom critical discussion and theorization about teams and teamwork in home care can be argued to result from home care being a limited research field. In other words, the field first needs to be described to gain a sufficient body of research for theorization. However, even if limited, theorization of the research that we now know about teams and teamwork in home care is useful to further our understanding and govern future descriptions. On the same note, it is also necessary to consider teamwork from a wider perspective to incorporate its more extensive effects, requirements, and limitations. This includes paying more

attention to contexts, to the nature of teamwork, and to the requirements of teams and their members as social processes (e.g. Goleman et al., 2002; Wheelan, 2005). It also includes relating findings to theory and terminologies in a proper manner (e.g. Flores-Sandoval et al., 2021). These are important, as variations between, e.g., multi- and interprofessional approaches, and distinctions between, e.g., 'teamwork' and 'network' can have significant practical implications. All this leaves one to wonder how teamwork is holistically understood.

Discrepancies aside, research indicates teamwork has possible beneficial effects on levels of experienced control and support at work among home care nurses (Larsson et al., 2022). Furthermore, nurses play a pivotal role in teams in this setting (ibid.). These are important findings, as the strained situation among nurses needs to improve for retention, health, and operational purposes (Estryn-Béhar et al., 2007; Möckli et al., 2020; World Health Organization, 2006). Providing nurses healthy working conditions is in the best interest of patients and nurses alike, and, for home care specifically, it is necessary to meet the increasing needs to deliver healthcare at home. Mutually promoting care, teamwork, and the work environment can be ways to achieve a 'good' practice – where work can be performed effectively, sustainably, with meaning and virtue (MacIntyre, 1981).

5.1.2 What can the failed Scanian-wide implementation of mobile home care teams tell us about existing dynamics between Swedish municipal and regional healthcare?

The attempt to implement supportive interorganizational team structures in Scanian municipal home care went against both forerunner examples and well-established knowledge of factors influencing success in teamwork (Rydenfält, Persson, Larsson, et al., 2023). This apparent absence of consideration given to theory and native pioneers in practice is both surprising and problematic. Findings mainly identify a resource shortage among community health centers to be the cause of their inability to live up to what had been agreed (Erlingsdottir et al., 2019; Rydenfält, Persson, Larsson, et al., 2023). However, variation in the agreement's interpretation and the conditions in local settings already resembling the intended team structure can also bring the dynamics and intentionality of communication between municipal home care and regional healthcare into question.

Teamwork is a highly complex form of collective work which require high levels of social interaction, which can be difficult to achieve even in confined institutional settings (e.g. Reeves et al., 2018; Weller et al., 2014). The mobile team structure is a special form of teamwork, where members are distributed, and work is performed across a geographical area. The team, its members, and their actions are not necessarily always isolated in one setting or time. To organize work this way with others in municipalities is well-established among home care nurses and illustrated

in the thesis' introductory narrative and research findings (Larsson, Erlingsdóttir, et al., 2024; Persson et al., 2023). What makes the mobile team structure—centered around home care nurses and general practitioners at regional community health centers—different and more difficult to foster is that it is interorganizational. This can introduce the potential of competing interests regarding engagement in teamwork.

The factors influencing success identified in Rydenfält, Persson, Larsson, et al. (2023)—namely having fixed general practitioners assigned to the team, collocating personnel, and having a shared team identity—adhere to the concepts of *stability*, *interaction*, and *cohesion* addressed as important for the relational nature of teamwork (Larsson et al., 2022). These factors are important for the formation and sustainability of a team. When comparing distinctions made by Reeves et al. (2018) with the interaction between home care nurses and regional healthcare, it is clear that 'teamwork' seldom occurs. Instead, organization of work would rather be classified closer to a 'network' (ibid.). This is further indicated by the recognized multidisciplinary approach taken where care responsibilities are kept clearly divided and no shared identity exists (Hall & Weaver, 2001; Rydenfält, Persson, Larsson, et al., 2023).

For home care nurses, the supportive team structure that was intended to develop turned out to be "a team that never was". At best, work remained as before. But mostly the team implementation resulted in more administrative work instead of supportive functionality. Thus, there seems to be a discrepancy between theory and practice. We know what facilitates and improves teamwork, but practice seems to have made it difficult to achieve. The apparent recreation of a 'business as usual' approach puts into question whether there really is a possibility for a 'team' to form between Swedish municipal and regional healthcare at large. Larsson et al. (2022) address how teamwork improvement interventions need to be carefully considered and executed so as to not affect conditions negatively. An important takeaway is to build upon the existing structures which are good, proceed from concepts known to foster effective and well-functioning teamwork, and allocate resources to realize them in practice (Rydenfält, Persson, Larsson, et al., 2023).

Given how 'team' is defined in this thesis, teamwork is a rare occurrence between Swedish municipal and regional healthcare. Rather, interactions between municipal home care and regional healthcare almost seem distanced. On the other hand, collective work in the municipal contexts seem to align more closely with the term 'team', suggested by the thesis' opening narrative and findings by Larsson, Erlingsdóttir, et al. (2024). Managing work in municipal care is hard work. Home care nurses acknowledge the interdependence they have with others and help each other out to make it work. However, even here, this takes effort and needs to be balanced against the distinct division of tasks and responsibilities of the municipality's professional groups.

5.1.3 What is state-of-the-art of digitalization in home care in relation to its ability to enable/disable communication?

One of the challenges identified in Persson et al. (2023) resonates well with the work's mobile nature and how the technological infrastructure requires home care nurses to continuously consider what technology to bring and use in the field. It is important for nurses to manage both physical and psychological strain at work. Working close to their office quarters—e.g., in urban areas—nurses often travel by bike or foot to, from, and between home visits. Here they are exposed to the weather conditions and limited in how much they can bring based on what they can carry. When working in more rural areas, they travel more by car. The common behavior of note-taking is an example of distributed cognition, putting information 'into the world' to alleviate their cognitive workload (Rogers, 2012). This is all important to consider and support when designing and procuring technology.

Technology can be an enabler of communication as much as it can be a disabler, depending on its use. The findings of Larsson, Erlingsdóttir, et al. (2024) show how the enactment of technology-mediated communication across the municipal–regional interface affects home care nurses' psychosocial work environment negatively. One factor that determines this impact is the available infrastructure's capability to achieve synchronicity. Synchronous communication was found an important source of control and support at work, allowing for convergence to happen (Dennis et al., 2008; Karasek & Theorell, 1990). Much of the nurses' available technology overall constituted media with capabilities with which they only achieve low synchronicity. Writing is an important and dominant communication modality, the fax being a prime example, which constitute a large part of communication taking place between nurses and regional healthcare. Other than making phone calls, technology does not facilitate opportunities to achieve higher synchronicity. However, the findings from Larsson, Erlingsdóttir, et al. (2024) show that, as communication is enacted here, even communication over the telephone is forced to low synchronicity levels, enforcing asynchronous communication.

Another factor that limits the nurses' influence are the associated routines and regulations of media use. On one side, certain information is not allowed to be transferred save through specific technology. This can be exemplified by patient information that is only allowed to be mediated through EHRs and fax. On the other side, digital systems between healthcare levels—e.g., EHRs—are often not compatible. This makes information not easily available nor shareable, and where the fax and telephone come in as important media to manually carry this otherwise 'safely' locked away information that is not allowed to be shared digitally. This offers home care nurses lower flexibility in their technology use in which they also must cover for a given media's capacities (or lack thereof).

Discrepancies aside, the findings also show that the nurses seek to influence their communication processes as best they can by adapting their use of media (ibid.). A great example of this is the spontaneous and independent implementation of visual communication through photographs observed across municipalities. This behavior, even though engaged through workarounds, is used to enhance what is communicated—i.e., increasing the information sent to make their messages clearer. Thus, the nurses and their collaborators are engaged in finding ways that better facilitate their communication, despite discrepancies present in technology and in their official routines.

The argumentation above is similar to that of the research field computer-supported cooperative work (CSCW). This field addresses how technology can support collaborative activity and coordination to achieve shared goals (Carstensen & Schmidt, 1999). Consolvo et al. (2004) provide an offshoot to CSCW in the care setting called computer-supported cooperative care (CSCC). CSCC is more people-centered and considers, e.g., emotions, trust, and privacy, to be more important than increased work efficiency and effectiveness (ibid.). Renyi et al. (2020) report that CSCC in home care can provide increased self-management, psychological relatedness, involvement, and understanding. However, they concluded that prior assessment of communication behavior and needs are helpful for successful implementations (ibid.). This is what this thesis can provide from the home care nurse perspective.

Non-holistic digitalization together with a multitude of media and routines for communication is a challenge for home care nurses to manage (Persson et al., 2023). Work becomes unnecessarily complex when old ways of working co-exist with new (and incompletely) digitalized ones, which contribute to rather than support psychological workloads. The highlight of digitalization as a continuous and ongoing process can be difficult in organizations under stress, as they imply managing constant transformation while simultaneously barely keeping afloat with current workloads. Holistic digital transformations are necessary but should be managed with caution, considering the social processes they affect so that guidance of transforming work and organization in desired directions is obtained (e.g. Daft & Lengel, 1986; Dennis et al., 2008; Short et al., 1976).

Opportunities for digitalization should be embraced, with challenges kept in mind, to support the nurses in their work. Communication needs are an integral part of home care nurses' working conditions, together with significant needs for accessing information (Persson et al., 2023). This track is further investigated and supported in Larsson, Erlingsdóttir, et al. (2024). Engagement in asynchronous communication adheres closer to properties displayed in linear classifications of communication (e.g. Shannon & Weaver, 1949). Synchronous communication better facilitates two-way communication, which is found to be important and something considered worth better supporting (Persson et al., 2023). This has much in common with interactive and transactive forms of communication models

(Barnlund, 1970; Rogers & Kincaid, 1981). This is important to consider, as transactive communication, especially the development of relationships, is an important part of the development of teams and teamwork.

5.1.4 How does communication mediation affect the psychosocial work environment among municipal home care nurses?

Larsson, Erlingsdóttir, et al. (2024) continue the track presented by Larsson et al. (2022) and Persson et al. (2023), in that: 1) teamwork is a source of control and support in work for nurses, and 2) communication is an integral part of their work. The findings of Larsson, Erlingsdóttir, et al. (2024) show that the nurses are essential for communication in home care. Swedish healthcare is not coherent—i.e., its specializations are not well-connected. While interdependent, each specialization exists and functions independently with seemingly no one holding care together overall. One example of this being the seeming absence of interest in an overall responsibility for the mobile team concept (Rydenfält, Persson, Larsson, et al., 2023). As a significant medical profession in municipal context, home care nurses act as a funnel for communication in the regional–municipal interface and it often befalls them to hold things together. This adheres to the findings of (Larsson et al., 2022).

The introductory narrative conveys the practice of communication for home care nurses. The involvement of several actors in the home care setting presents a ‘problem with many hands’ situation (Dixon-Woods & Pronovost, 2016). Because communication in this context is characterized by a lack of predictability, they must constantly monitor and work proactively to stay ahead of the game in an unpredictable environment. Things need to be made sure to work. If not, they need to be 'fixed' to be made right. Errors need to be corrected. Things that fall between the cracks need to be caught. This is done with the best interest of the patients kept in mind. Nurses have to make ‘it’ work. Here ‘it’ can be many things. They tie the team together. They mend communication. They correct errors. They are essential linchpins for the function of Swedish healthcare at home and catch that which otherwise would simply fall through the cracks.

The communication activities the nurses are involved in can result in both positive and negative effects on their psychosocial work environment. Likening their role to communal ‘linchpins’ has been expressed as something that contributes to making their work attractive (De Groot et al., 2018). With this metaphor, they are likened to an “important member… or part of a system, that holds together the other members or parts… [and make]… it possible for them to operate as intended” (Cambridge Dictionary, n.d.). Their work has been described as a networking and collective practice, making a ‘net’ around their patients (Bjornsdottir, 2018). In Sweden, home care nurses are often referred to as “spiders in the web” (Andersson & Karnehed,

2007; Dahl, 2021). Being '[the] spider in the web' (swe. *"Spindeln i nätet"*) is a common Swedish metaphor meaning *a person who contextually holds a key position, is a key figure, or has an important role that pulls things together*. The metaphor is, in common parlance, considered positive, as it depicts a person as competent, having a central role, and being contextually important.

The 'spider' metaphor has been central for me in making sense of the role of home care nurses and their work. However, as I have experiences myself in the field of nursing, it can also be considered an unwelcome and undesirable metaphor. Not only because one is likened to an eight-legged arachnid, but also in that nurses don't want to be given the appearance of having the overall responsibility for everything. Rather, nurses want to be considered part of a team where everyone has a role to play with their own respective responsibilities. This has been lifted from the perspective of nursing in a rehabilitation clinic in a debate article in the Swedish magazine *'Vårdfokus'* (K, 2014). To me, the home care 'spider' is a symptom of a healthcare system that does not fully function as it should, and where home care nurses often must mantle this role for the sake of their patients. It visualizes their role, the care that they take for themselves and others, and the demands of their work.

Knowledge of the unnecessary shortcomings in home care are not novel for the people working in this context. Tragically, they also know that they have little ability or authority to influence the situation. You must accept your situation and be happy with what you get—do your best, do your job, and communicate as best you can. Larsson, Erlingsdóttir, et al. (2024) show the complex communication engaged by home care nurses. The great importance of synchronizing in their daily work tells of their high engagement in complex social interaction. Even if their work is mobile, meetings and communication in the field are frequent. The high value of oral communication—i.e., higher synchronicity either face-to-face or over telephone—for providing mutual control and support in daily work, is in line with theory on communication and processes important for teamwork (e.g. Dance, 1967; Marlow et al., 2018). Due to their interdependence, media with capacity to enable 'rich' communication are used for mutual control and support among the nurses and those with whom they work together with; e.g., licensed practical nurses, nursing assistants, home health aides, and therapists.

Larsson, Erlingsdóttir, et al. (2024) pinpoint that communication in the home care context can be ineffective, late, and one-sided, with the information that is conveyed often incomplete or incorrect. This contributes to nurses experiencing demands and having to constantly check, follow-up, and fix what is communicated. The findings indicate that this can be a strategy for increased control, but at the cost of others. Ibid. also pinpoint that communication also can be effective, early, and interactive, with conveyed information being both accurate and deliberates. This demands home care nurses to be available and willing to engage in communication. However, it also contributes to an experience of greater control and support as a collective;

factors associated with a healthy work environment. It all depends on the mix of what media are available, their capabilities, how communication is facilitated, and the intent among communicators to engage with each other. Communication is a mutual exchange, and how we choose to communicate have effects for others. Technology can make it easier to communicate over distance and time. However, technology can just as easily enable people to take control over communication by making it asynchronous. This situation can be postulated to happen more likely when work is strained, and control over communication can be made into a way to guard time and resources among workers. Teamwork is important to task performance, and social relations are important for well-being. As work in home care is complex, this highlights the need for enabling higher synchronicity in communication and possibilities for (or willingness among) practices to engage in interaction.

The narrative at the beginning of this thesis illustrates the value of 'good' collaborators; those who listen and understand. This implies a supportive mindset continuously maintained in the municipal context, and is very appreciated if it happens to occur together with regional healthcare. However, the more common phenomenon of low synchronous communication with regional healthcare is a constant challenge. This cause home care nurses to experience a loss of control over their work situation due to communication breakdowns, waiting for answers to come back, and low synchronicity, lead to tasks becoming urgent. In addition, support is not provided when asked for. As communication over the municipal–regional interface is either of low synchronicity or asynchronous, dominated through writing thus better supporting conveyance over convergence, this does not constitute beneficial conditions for teamwork and negatively contributes to home care nurses' psychosocial work environment. This is supported by teamwork and communication theory (e.g. Dance, 1967; Dennis et al., 2008; Karasek & Theorell, 1990; Wheelan, 2005). Synchronous communication should be better facilitated as one way of fostering teamwork as a source of control and support to develop a holistically healthier psychosocial work environment.

5.1.5 What did the adoption of novel technologies bring to the 'new normal' in home care nursing practice?

The findings in Larsson, Rydenfält, et al. (2024) show a significant change in home care's technology use during the COVID-19 pandemic and the first stages of the 'new normal'. The catalyst behind the change was one born out of necessity: keep social distance to prevent infection while simultaneously keeping interaction going to safeguard the provision of home care. Despite the new environmental situation, the need for 'rich' interaction persisted (Daft & Lengel, 1986).

The three technologies described in Larsson, Rydenfält, et al. (2024) were three reforms introduced to manage the new work situation according to their respective capacities. The infection rate lists were designed and used to achieve situational awareness, to support proper decision making and to guide future action (e.g. Endsley, 1995). Digital faxing freed communication with regional healthcare from the office, basically making home care remote office work to a degree, to ensure continuity and alleviate workload (e.g. Olson, 1983). Both technologies constitute media capable of supporting low synchronicity (Dennis et al., 2008). However, digital meetings were different. They became the best way to uphold a sense of social presence for the collective in larger groups, and therefore came to be the only technology introduced with capabilities for higher synchronicity (Dennis et al., 2008; Short et al., 1976).

The technologies' 'new normal' use was based on the reestablishment of pre-pandemic conditions governing their use. The end of infection status lists and continuation of digital faxing in Larsson, Rydenfält, et al. (2024) are both examples governed by rule-based use. The essential role of infection rate lists during the pandemic came with their capability to provide situational overview. Furthermore, this was a technology designed by the nurses themselves to fit their needs. Although not explicitly stated, its sudden disappearance may very well be based on its use of patient information, its existence online and outside of the EHR, and that it was shared. In other words, it could not be considered legally justifiable to continue its use. The digital fax's continued use is founded on its replacement of the analogue fax, but not the necessary (and not always beneficial) underlying 'faxing' practice. Although asynchronous, faxing remains fundamental, as it serves as a direct link between home care nurses and, e.g., individual community health center general practitioners. However, it is widely perceived an outdated practice, and is also classified as unsafe as it's often not encrypted which results in the nurses having to encrypt/decrypt information that is sent by hand. Instead of tapping into its new capabilities—e.g., the physical confinement of communication—its use melted into the old technology's usability in the 'new normal' environmental conditions.

On the other hand, the 'new normal' use of digital meeting technology can be seen as having gone from being rule-based during the pandemic, to voluntary post-pandemic. Its use can be considered to be governed on subjective norms (Ajzen & Fishbein, 1975). Digital meetings are, in the 'new normal', an alternative, not a substitute, to social presence that offers attendance flexibility when suitable (Short et al., 1976). The contribution of digital meeting technology into home care changes the preconditions to achieve better interaction by its capabilities as a media for higher communication synchronicity (Dennis et al., 2008). Although acknowledging its benefits, nurses remain cautious about adopting the technology because they don't want it to become a substitute for physical meetings (Larsson, Rydenfält, et al., 2024). This can indicate a lack of trust among nurses towards, e.g., general practitioners based on knowledge of how interaction has historically taken

place. In other words, preconceptions of the intentionality towards interaction can be said to dictate the norms and adoption of digital meetings (Ajzen, 1985; Larsson, Rydenfält, et al., 2024).

Both TAM and TTF describe technology acceptance and task-technology-fit respectively as linear processes (Goodhue & Thompson, 1995; Venkatesh & Bala, 2008; Venkatesh & Davis, 1996). However, the findings of Larsson, Rydenfält, et al. (2024) indicates that feedback loops concerning the experience of use also exists. Later versions of the TAM model (e.g., TAM2, TAM3, and UTAUT) include the construct of *experience* (Venkatesh & Bala, 2008; Venkatesh & Davis, 2000; Venkatesh et al., 2003). However, it is not predominantly conceptualized as feedback from previous use.

5.2 Home care nurse communication from a socio-technical perspective

The findings of Larsson, Erlingsdóttir, et al. (2024), Larsson, Rydenfält, et al. (2024) and Persson et al. (2023) increase the knowledge of communication's importance within the home care context, specifically for nurses. The findings of Larsson et al. (2022) and Rydenfält, Persson, Larsson, et al. (2023) showcase the importance of teamwork for home care nurses and the practical difficulties when trying to enable its largescale development across municipal–regional organizations. The appended papers' combined argumentation is that it is through the enactment and mediation of communication through media that social processes needed for teamwork are enabled and partaken in shaping the conditions behind nurses' psychosocial work environments. This leads to a socio-technical view of home care.

The conceptualization of communication is often something intangible and assumed to be immaterial (Packer & Wiley, 2013). However, this does not mean that communication cannot have materiality. Dourish (2017) argues that communication has materiality as it is mediated through technology. An example of this is how even digital technology which only exists on screen—i.e., even if not physically 'real'—can have real-world importance and effects. Another argumentation is made by Ashcraft et al. (2009) who argue communication to have materiality through its generative ability to define realities. This argumentation is similar to the view that communication constitutes organizations (CCO). Cooren et al. (2011) provide a premise of the constitutional, (re-)productional, and shaping power of communication for organizations by what happens in and through it.

Sociomateriality emphasizes this constitutional role of communication while also exploring the social and material dimensions of technology and organization (e.g. Leonardi & Barley, 2010; Orlikowski & Scott, 2008). From a socio-technical

standpoint and the distinction made by Leonardi (2012), the sociomateriality of communication in home care is the nurses' local experience around their use of technologies as media for communication and how this communication's materiality has effects on the social based on what processes are enabled. On the same note, 'socio-technical system' refers to the organization of work on a larger and more abstract scale.

Viewing Swedish healthcare and its workflow as one holistic socio-technical system is problematic due to the high specialization in healthcare and presence of healthcare levels. Rather, the healthcare system can be better understood to be represented as different socio-technical systems. On that note, municipal home care can be considered a socio-technical system with its own distinct social, technical, and environmental subsystems. Teamwork is a representation of the social subsystem through its facilitation through people and their social processes, roles, relationships, communication networks, etc. (Trist & Bamforth, 1951). Communication is in and of itself a social interaction taking place through media; e.g., through technology or face-to-face. It can thus be understood that communication is enacted through the technological subsystem. The psychosocial work environment can be understood to be part of the environmental subsystem, as it encompasses conditions that affects social- and technological subsystems.

Home care and the other socio-technical systems can be said to have varying degrees of overlap. The social subsystems constitute the organizations presence of people and the governing institutional ideas regarding how they are intended to work and interact together. The technical subsystem, also referred to as 'sociomaterial practice' is the space where work is made possible through the overlap of social and material agencies (Leonardi, 2012). The social agency is the coordinated agencies of home care nurses and those with whom they work to interact as they intend. This includes the intention to interact, and the perception of what technology allows them to do; i.e., technologies' perceived capabilities. The material agency instead depends on the approach to technology and how its materiality is activated; i.e., how technology is used and what capabilities for communication they utilize. There must be a mutual social agency to engage in teamwork as well as material agency allowing necessary communication processes to facilitate it.

The technical subsystem of home care is, to some degree, shared with that of others such as regional healthcare via the presence of information and communication technologies. These media are used as connections to allow interaction to take place across healthcare's interdependent socio-technical systems. Their social subsystems are not, however, shared, as they constitute different organizations, their members seldom meet, and there exist different agendas and incentives to engage (or not engage) in interaction with each other. Thus, the social agency of actors across the systems interface is not necessarily the same—i.e., the intentionality behind communication is not shared. The situation between home care nurses and, e.g., homemaker services is significantly more overlapping. They both reside in the

municipal setting, they meet regularly, and they often have a mutual understand of each other's situations. They are situated closer to each other and help each other out. To value the another's situation as a realization of the interdependent situation translates to the eagerness to engage in interaction. In other words, their social agency is shared.

Based on the social interactions and what aspects of media's materiality are enacted, this has consequences for the socio-technical system's environmental subsystem such as the demands, control, and support present at work. These conditions, in turn, can contribute to the enactment (enforcement or change) of social and technological subsystems. The adoption and change in technology use can change the capabilities of social processes to be enacted by changing, e.g., the level of synchronicity in communication. This resonates well with what Persson et al. (2023) addresses in that technological implementation translates to simultaneous organizational change. Implementing new or continuing the use of old technologies unconditionally can have sociomaterial consequences on micro- and meso-levels (Leonardi, 2012). However, actual change also depends on the social agency, intentionality, and conditions among users.

5.3 Research contributions and implications for practice

This thesis provides empirical, methodological, and theoretical contributions. The thesis' contributions are based on the contributions of each individual paper, the previous discussion from the point of each research question, and the deepening perspective from a socio-technical perspective where findings of the five appended papers are integrated.

The first empirical contribution of the thesis is providing research in a field that is not well-known or understood. The thesis provides increased knowledge into how home care nurses' communication and its mediation effects teamwork and nurses' psychosocial work environment. This knowledge can be used in the field by societal actors such as the National Board of Social Affairs and Health, regions, and municipalities in Sweden to improve the situation of home care nurses and other professionals in the municipal setting. In practice, the research findings can be used by home care nurses to influence their everyday work.

One of the major theoretical contributions is the combination of the MST and JDCS frameworks in Larsson, Erlingsdóttir, et al. (2024). This is probably a unique combination which connects synchronicity of communication to demand, control, and supportive factors in the psychosocial work environment. Another theoretical contribution is the report of feedback loops present in Larsson, Rydenfält, et al. (2024) use of the TAM framework. This finding indicate that technology acceptance may not be a linear process, as is often depicted in the common technology

acceptance models, but is rather recursive. A third theoretical contribution is to consider home care a socio-technical system in which communication has sociomaterial properties.

The methodological contribution of this thesis is the utilization of ethnographic sketching as a data collection and early analysis method. The sketches presented here are ‘spatial memories’; representations and early interpretations of data, as well as imagery offering insight into the context of home care nurses.

Chapter 6
Conclusions

Teamwork is complex and increases in importance when home care provision expands, demanding a more cohesive healthcare system. The Swedish healthcare system is divided into levels, and much of the communication between these levels is mediated through technology. Technology is an important mediator for communication, but it also dictates how social processes are made possible. However, the processes enacted between healthcare levels are not very supportive of teamwork.

This has effects on home care nurses and their psychosocial work environment, as they are the necessary linchpins holding home care together. They make 'it' work. Work in home care is complex, as it involves taking care of others. This is one of the qualities that make us human—caring for one another—and technology should support this quality and the social processes necessary for it.

Communication of the right kind is important for the psychosocial work environment of any profession. What you do affects the situation of another in an interdependent situation. The combined role of technology and organization for communication is important to consider and can be useful for 'team thinking' to emerge. The main conclusions and insights from the research presented in this thesis are:

- Little is known about teamwork in home care, especially about the skills necessary to manage it, its relationship to technology use, and its effects on the work environment.
- Teamwork can be an important source of control and support for nurses. When implementing teams as a work form, it is important to consider success factors identified in scientific literature and conditions among professionals that need to work to be successful.
- The state-of-the-art of digitalization in home care has several challenges to address. However, there are opportunities, as well. It is important to proceed from the perspective of personnel needs and evaluate effects continuously to guide digitalization in a desirable way.
- How communication is enacted and functions is important for home care nurses' psychosocial work environment. As it functions inside the

municipal context, communication processes are better supported by media through their capabilities to support teamwork. However, for example, with regional healthcare, communication is kept asynchronous, which is not supportive of teamwork. Communication is a mutual exchange, and how we choose to communicate have effects for others. The more communication is locally optimized to favor one-sided advantages, the more communication on a holistic level is sub-optimized and the dependent side suffers.

- Technology played an important role for the provision of home care during the COVID-19 pandemic. The adoption of novel technologies brought new capabilities and possibilities to work more effectively in the 'new normal'. Thanks to the pandemic, nurses were allowed to explore new technologies. However, novel technologies' use was also affected by usability problems and was shaped by experience from prior use.
- From a socio-technical perspective, teamwork is part of home care's social subsystem. Communication is enacted through media present in the technical subsystem. The blend between social and material agencies—i.e., intentionality and capabilities—create effects for the psychosocial work environment. The work environment is part of the environmental subsystem which, in turn, creates conditions under which social processes take place in social and technical subsystems.

I will end the conclusions by returning to the opening quote by Louise Bourgeois at the beginning of the thesis. Her quote tells the tale of her spider-sculpture 'Maman' (eng. "Mother") being a momentum to her own late mother with metaphors of strength and care: spinning, weaving, nurturing, and protection. For me, this quote and my use of the 'spider' metaphor is a testimony to all home care nurses in Sweden making the best of what they have to make it all work. Thank you!

> *"The Spider is an ode to my mother. She was my best friend. Like a spider, my mother was a weaver. My family was in the business of tapestry restoration, and my mother was in charge of the workshop. Like spiders, my mother was very clever. Spiders are friendly presences that eat mosquitoes. We know that mosquitoes spread diseases and are therefore unwanted. So, spiders are helpful and protective, just like my mother."*
> - Louise Bourgeois (Tate, 2008)

Chapter 7

Future research

The thesis findings identify several areas for future research.

- Larsson et al. (2022) pinpoint the need for future research to provide richer descriptions of context and be more explicit as to how 'team' and 'teamwork' are defined and used. Employing appropriate methods and a narrative approach can be ways to better convey the complexity of work and its dynamics. To provide clearer definitions of 'teams' and teamwork' in healthcare literature aids in bringing clarity to terms and avoiding potential confusion.
- The thesis results indicate a closer collaboration among nurses and other professionals within the municipal context than with the region. General practitioners and other physicians, although essential, seem not to be considered members part of the 'team'. It would be considerable interest to investigate what this 'team' is to better understand its dynamics.
- The study of Larsson, Erlingsdóttir, et al. (2024) was conducted on home care nurses. The other identified professional groups have communication pathways of their own which can have effects on their work environment. It would be of considerable interest to conduct the same type of study on these groups as well to understand their respective situation and how communication dynamics effect home care on a higher system level.
- Ibid. focus on how communication synchronicity through individual media can influence the psychosocial work environment of home care nurses, not the synchronicity of their tasks as a whole. The completion of tasks may include the use of a combination of media, not just one, and be spread out over time. The resulting synchronicity of task completion among groups and its effects on their psychosocial work environment would be of considerable interest to study in the future.
- The findings of Larsson, Rydenfält, et al. (2024) address the impact experience and environmental conditions can have on technology adoption and use. Additionally, the lack of agency behind home care nurses' technology use is addressed. It would be of considerable interest for research to investigate technology acceptance and fit with work as a

potential dynamic process further also giving context, feedback, agency, and control at work greater space and consideration.

- Narrative and ethnographic sketches work together in this thesis to position information in a frame of time and space. As '*spatial memories*' they recreate the conditions and feeling present at the time of observation, telling tales of the field that depict and increase our understanding of home care nurses work conditions in an engaging way. Qualitative research should embrace the potential of sketching and storytelling more to give thicker descriptions of context and tell empirical in situ tales that appeal readers and provide insights into the life of others in engaging ways.

Home care and healthcare have distinct dynamics that influence their circumstances. However, the thesis' overall topic, findings, discussion, and conclusions can be highly relevant and applicable in other areas as well. The introduction points out that good communication is central to all aspects of life – work or private. As we live in the information age, the access to information and fast communication is greater than ever before. Understanding how communication and technology can affect wellbeing and social interaction is important in modern society for achieving a mutual benefit (and need) of increased efficiency and for us to be human.

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