General practitioners´ and patients´ experiences and expectations

A cross-sectional study from Norwegian and Nordic general practice

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Torunn Bjerve Eide

Department of General Practice, Institute of Health and Society, University of Oslo

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1 ACKNOWLEDGEMENTS

In 2012, I contacted Professor Jørund Straand, head of the Department of General Practice at the University of Oslo, and was warmly welcomed to the department and introduced to the Quality and Costs of Primary Care in Europe (QUALICOPC) study. In the years that I have been a part of the department I have learnt that this welcoming attitude is the default setting of both professor Jørund Straand and the rest of the "seniors" at the department: an ever present enthusiasm towards any general practitioner (GP) who wants to engage in research.

Much gratitude goes to my supervisors, Elin Olaug Rosvold and Jørund Straand, for continuous and warm support throughout the study period. They have both helped me believe that in the expansive QUALICOPC material, there was information worth exploring. They have been easy to reach when help was needed, and thorough in their feedback. Thank you to Jørund for always reminding me of the importance of the question "So what?", and to Elin for many valuable discussions about both research and other parts of life.

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2 SUMMARY

Background: Comprehensive primary care services are associated with better healthcare quality. To provide comprehensive services in general practice, a wide array of knowledge, skills and medical equipment is required from the general practitioners (GPs). Nonetheless, knowledge is scarce regarding differences in medical services offered by GPs and regarding the expectations from the population concerning the provided services.

Aim: The aims of this thesis are to describe and compare the range of technical equipment and the involvement in medical procedures and follow-up provided by GPs in the Nordic countries, to study associations between organisational factors and Norwegian patients´ experiences in GP consultations, and to explore possible differences between GPs´ and patients´ expectations regarding the GPs´ services in Norway.

Material and methods: The thesis is based on data from the study Quality and Costs of Primary Care in Europe (QUALICOPC), an international study led by the Netherlands Institute for Health Services Research in 34 countries between 2011 and 2013. The present study employs data from 875 Nordic GPs (198 from Norway, 212 from Denmark, 97 from Sweden, 288 from Finland and 80 from Iceland) who responded to a questionnaire regarding their practices. In addition, questionnaire data from 1529 Norwegian patients concerning experiences with and expectations to GP visits were analysed. The patients were recruited in the GPs´ waiting room on a randomly selected day. Data were analysed using binary logistic regression. A generalized estimating equation model was employed to correct for the multilevel nature of the material.

Results: GPs in the Nordic countries performed a wide spectrum of medical procedures and were involved in the follow-up of patients with a wide selection of diagnoses, albeit with a noticeable variation between countries. In general, the GPs were well equipped, but the Finnish GPs more frequently than their Nordic

colleagues had access to advanced technological equipment like ultrasound and gastroscopes. Ninety per cent of Norwegian and 86% of Danish GPs inserted intra-uterine devices, and were significantly more likely to do this procedure than GPs in the other Nordic countries (Sweden 20%, Finland 70%, Iceland 13%). Icelandic GPs were less likely than Norwegian GPs to be involved in follow-up of patients with a selection of medical conditions, including rheumatoid arthritis, (Odds Ratio (OR) 0.2 [95% confidence interval 0.1-0.3]), myocardial infarction (OR 0.2 [0.1-0.3]), and Parkinson´s disease (OR 0.1 [0.1-0.3]).
The study patients, all Norwegian, reported an overall positive experience with the GP consultation. Patients visiting GPs with a short patient list (≤900) were less likely than patients visiting GPs with medium sized patient list (900 – 1300) to answer that the GP was polite (OR 0.2 [0.1-0.7]), that the GP asked questions about the health problem (OR 0.6 [0.4-1.0]) and that the GP took sufficient time in the consultation (OR 0.5 [0.3-0.9]). The patients who visited a GP with longer patient lists (> 1300) were more likely than patients of medium list GPs to report that the GP hardly looked at them (OR 1.8 [1.0-3.0]) and less likely to report that they could cope better with their problems after the visit (OR 0.5 [0.3-0.9]).
When compared with patients´ expectations, Norwegian GPs overestimated to what degree their patients would see them for a variety of common medical problems, e.g. deteriorating vision (OR 4.2 [2.5-6.9]), anxiety (OR 3.0 [1.5-6.0]), and sexual problems. (OR 1.8 [1.3-2.6]).
Conclusions: Differences in the medical services offered by Nordic GPs may be related to variations in remuneration systems, geographical variations and differences in customary task distribution within the health systems. Our study suggests that from the patients´ point of view a medium size patient list is preferable to allow for a more positive communicative experience in the consultation. Norwegian GPs seem to overestimate to what degree their patients will see them regarding a variety of common medical problems.

3 NORSK SAMMENDRAG/NORWEGIAN SUMMARY

Bakgrunn: En sterk og omfattende primærhelsetjeneste er assosiert med bedre kvalitet på et lands helsetjenester. Et bredt spekter av kunnskap, ferdigheter og medisinsk utstyr er nødvendig for å tilby helhetlige tjenester hos allmennlegen. Vi har lite kunnskap om forskjellene i tjenestetilbud hos allmennleger og om forventningene i befolkningen angående dette tilbudet.

Formål: Målet med denne avhandlingen er å kartlegge og sammenligne hvilke medisinske tjenester nordiske allmennleger tilbyr, å utforske assosiasjoner mellom organisatoriske forhold og norske pasienters opplevelse av kommunikasjonen med allmennlegen, samt å undersøke forskjeller mellom pasienters og legers forventinger til allmennlegens tjenestetilbud i Norge.

Materiale og metode: Avhandlingen er basert på data fra studien Quality and Costs of Primary Care in Europe (QUALICOPC), en internasjonal studie fra 34 land planlagt og organisert av Nederlands institutt for helsetjenesteforskning mellom 2011 og 2013. Vår studie omfatter data fra 875 allmennleger (198 fra Norge, 212 fra Danmark, 97 fra Sverige, 288 fra Finland og 80 fra Island) som besvarte spørreskjemaer om egen praksis, samt data fra 1529 spørreskjemaer besvart av norske pasienter vedrørende forventninger til og opplevelser ved besøk hos allmennlegen. Pasientene ble rekruttert i legens venterom på en tilfeldig valgt dag. Det ble utført binære logistiske regresjonsanalyser med en «generalized estimating equation» modell for å korrigere for materialets nivådelte struktur.

Resultater: Vi fant at allmennleger i alle de nordiske landene utførte et bredt spektrum av medisinske prosedyrer og var involvert i oppfølgingen av et stort utvalg ulike tilstander, men det var likevel vesentlige forskjeller mellom landene. Allmennlegene hadde generelt et godt utvalg av medisinsk utstyr, men de finske allmennlegene hadde oftere tilgang til avansert teknisk utstyr som ultralyd og gastroskop enn sine nordiske kolleger. Nitti prosent av norske og 86% av danske

allmennleger satte inn spiraler, og de hadde signifikant høyere sannsynlighet for å gjøre dette enn legene i de andre nordiske landene (Sverige 20%, Finland 70%, Island 13%). Islandske allmennleger hadde lavere sannsynlighet enn de norske for å være involvert i oppfølgingen av flere medisinske problemstillinger, blant annet reumatoid artritt (OR 0.2 [0.1-0.3]), hjerteinfarkt (OR 0.2 [0.1-0.3]) og Parkinsons sykdom (OR 0.1 [0.1-0.3]).

Pasientene som deltok i studien, som alle var norske, rapporterte en i all hovedsak positiv opplevelse i legekonsultasjonen. Pasienter hos allmennleger med liten pasientliste (≤900) hadde mindre sannsynlighet enn de som konsulterte leger med middels stor pasientliste (900-1300) for å svare at legen var høflig (OR 0.2 [0.1-0.7]), at legen stilte spørsmål om helseproblemet (OR 0.6 [0.4-1.0]) og at legen brukte tilstrekkelig lang tid på konsultasjonen (OR 0.5 [0.3-0.9]). Pasientene som besøkte leger med lang pasientliste (>1300) hadde større sannsynlighet enn pasienter hos leger med middels liste for å svare at legen nesten ikke så på dem under konsultasjonen (OR 1.8 [1.0-3.0]) og mindre sannsynlighet for å svare at de bedre kunne håndtere helseproblemene sine etter legebesøket (OR 0.5 [0.3-0.9]).

Sammenholdt med svar fra pasientene overvurderte norske allmennleger i hvilken grad pasientene deres vil oppsøke dem for et utvalg symptomer og plager, som nedsatt syn (OR 4.2 [2.5-6.9]), angst (OR 3.0 [1.5-6.0]) og seksuelle problemer (OR 1.8 [1.3-2.6]).

Konklusjoner: Forskjellene i helsetjenestetilbudet blant nordiske allmennleger kan være relatert til variasjoner i økonomisk rammeverk og refusjonssystemer, geografiske forskjeller samt ulikheter i sedvane for oppgavefordeling innen helsetjenesten. Fra pasientens synspunkt er det holdepunkt for at en middels stor pasientliste er å foretrekke for å oppleve bedre kommunikasjon med legen. Norske allmennleger kan synes å overvurdere i hvilken grad deres pasienter oppsøker dem ved vanlige helseplager.

4 PREFACE

Seven years ago I started working as a GP in downtown Oslo, after several years as a rural GP in Froland municipality in Southern Norway. I was naturally a bit nervous about what this new setting would entail, but in the end I was mainly struck by the similarities between my two practice experiences. Both the urban and the rural patients seek the GP for a variety of minor and major physical and mental complaints, and even in central Oslo, where many private organ specialists offer their services, patients primarily seem to want a doctor who knows them and their background. The role of a true family doctor, interacting with several generations in a family and providing continuity over time and across different health problems, is still as important in my current practice in Oslo as it was in my former practice in Froland.

There were obviously also differences between the two work experiences related to the geographical location of the practices, as both the necessary equipment and the GPs´ required and acquired skills will be affected by the distance to hospital and the centrality of the practice. In a smaller community with longer travel distance to hospital, the emergency care was more present as a part of my everyday practice, whereas in the big city the super-acute somatic incidences only rarely appear in my office. On the other hand, in a smaller community the psychological and geographical distance to other parts of primary care services was short; thus, interaction was rather effective and I often felt less alone than I sometimes do in Oslo when dealing with the most difficult situations. The rural patients were often expecting the GP to be able to handle most medical issues, whereas in the big city I am occasionally met with some surprise from my patients when they understand the comprehensive role of the GP. These experiences, as well as communication with colleagues in different parts of the country and in other European countries, spiked my awareness of and interest in

the differences and similarities in the work of the Norwegian GPs throughout the country.

When I started working with the data collection for the QUALICOPC study in 2013 (1), the Norwegian regular GPs and primary healthcare were not at the centre of attention for everyday media or most health politicians and bureaucrats. The Health Coordination reform of 2012 (2) had admittedly contributed to a somewhat raised public awareness towards the central role of primary healthcare and the regular GPs in a cost efficient healthcare system, underlining the need for the primary healthcare system to take on more tasks from the specialist services. The reform signalled a needed increase of 2000 regular GPs to meet with the new demands. At the same time, updated knowledge on the daily tasks of the regular GPs was scarce. I therefore wished to explore the data from the QUALICOPC study to supply more knowledge on the work of the Norwegian GPs. As I am about to complete my thesis, the picture has changed significantly. The Norwegian Directorate of Health and the regular GPs themselves have published detailed reports on the increasing workload of the GPs (3, 4). In June 2018, the annual economical negotiations between the Norwegian government and the Norwegian Medical Association (NMA) came to a halt because of disagreement regarding the economic framework for the regular GPs. The media have offered a steady supply of articles and commentaries on the risk of impending collapse of the regular GP scheme due to work overload. At the same time, GP recruitment is declining. A long overdue discussion about how to preserve the role of the GPs without overburdening the doctors is ongoing, and it has far from concluded. The recruitment problems affected the less central parts of Norway first and most severely, but lately the bigger cities also experience increasing problems in filling vacant GP positions (5). It is beyond the scope of this thesis to describe and analyse the current situation with work overload and recruitment problems in Norwegian general practice, but I hope to contribute to

the compilation of knowledge needed when restructuring of health services is discussed.

Studying the tasks of GPs and the consequences of different organisational frameworks may seem like an attempt to describe the impenetrable. General practice is a complex research setting, where expectations from both healthcare providers and healthcare users, organisational and economic framework in different countries, and the inclusion of patient related outcome measures, such as the quality of communication or the effect of healthcare provider continuity, all come into play. The researchers own clinical experiences and preconceptions may affect both the identified research areas and the interpretation of results. It may appear that any attempt to, through research, disentangle this convoluted reality invariably comes with a danger of oversimplifying or ignoring alternate explanations to research findings. However, in this thesis I have taken inspiration from the late Norwegian pioneer in general practice research, Olav Rutle, who stated that *"No matter which methods of analysis used, a research project will always represent a crude simplification of the reality you try to describe…. This, however, is not an argument against mapping parts of the factors that affect the GPs´ work"* (translation by author) (6). Our findings and conclusions may not be flawless, but they constitute a contribution to the relatively meagre field of research focusing on the activities that take place within GPs´ practices.

5 LIST OF PUBLICATIONS

This thesis is based on the following three articles, which will later be referred to by their roman numerals:

I. Eide TB, Straand J, Björkelund C, Kosunen E, Thorgeirsson O, Vedsted P, Rosvold EO. *Differences in medical services in Nordic general practice: a comparative survey from the QUALICOPC study.* Scand J Prim Health Care. 2017;35(2):153-61.

II. Eide TB, Straand J, Melbye H, Rortveit G, Hetlevik I, Rosvold EO. *Patients´ experiences and the association with organisational factors in general practice: results from the Norwegian part of the international, multi-centre, cross-sectional study QUALICOPC.* BMC Health Serv Res. 2016;16(1):1-9.

III. Eide TB, Straand J, Rosvold EO. *Patients´ and GPs´ expectations regarding healthcare-seeking behaviour: a Norwegian comparative study.* BJGP Open 13 November 2018; bjgpopen18X101615

6 LIST OF ABBREVIATIONS

CI	Confidence Interval
CME groups	Continuing medical education groups
COPD	Chronic Obstructive Pulmonary Disease
CRP	C-Reactive Protein
FQ	Fieldworker Questionnaire
GDP	Gross Domestic Product
GEE	Generalized Estimating Equations
GP	General practitioner
GPQ	General Practitioner Questionnaire
IUD	Intra Uterine Device
NIVEL	Netherlands´ Institute of Health Services Research
NMA	Norwegian Medical Association
OECD	Organisation for Economic Co-operation and Development
OR	Odds Ratio
PEQ	Patient Experiences Questionnaire
PVQ	Patient Values Questionnaire
QUALICOPC	Quality and Costs of Primary Care in Europe

7 BACKGROUND

7.1 Introduction

A general practitioner is both what the name entails – a generalist – but also a specialist in handling complex medical and psychosocial issues in a primary healthcare setting. To obtain an efficient and comprehensive primary care, the GPs should know both their patients and their local community and be able to conduct a respectful and empathic communication with the patients. They need to master a diversity of medical diagnoses and procedures and have sufficient medical equipment. Furthermore, the GPs and their patients should have a somewhat mutual understanding of which medical and psychosocial issues a GP can be expected to assist with. The GPs are the main providers of continuity of care, following their patients both over time and across different health problems (7, 8). Continuity is an essential aspect of general practice(9), and is associated with patient satisfaction (10), the GPs´ use of resources (11) and even with reduced mortality (12) .

To obtain more knowledge about the GPs´ work and the patients´ attitudes towards general practice throughout Europe, the QUALICOPC study was initiated and coordinated by the Netherlands Institute for Health Services Research (NIVEL). The study encompasses questionnaire information from 7800 GPs and 69 000 patients from 34 countries (further described in chapter 9 of the thesis). (1). Data collection took place from 2011 to 2013. The main results of the QUALICOCP study have been published in international comparative studies (13-19). However, national data from the participating countries contain details about local particularities that are lost in such large multinational comparisons; thus, this thesis explored the Norwegian and Nordic data from the QUALICOPC study. The study aimed to increase the knowledge of which services that are provided by Nordic GPs (technical equipment available, medical procedures

employed and involvement in follow-up of medical conditions) (article I), to study the association between structural and organisational factors and patient experiences in a Norwegian population (article II), and to investigate possible differences between Norwegian GPs´ and patients´ expectations towards the GPs´ work (article III). These are aspects that are possible to measure and explore with standard epidemiological methods. Although our approach does not completely capture the complexity of general practice, it offers insight into the daily life of the GP and provides important knowledge on a so far meagrely researched field. The focus of the thesis is mainly on Norwegian general practice. The background section will give a brief outline of the Norwegian primary care system in order to provide a framework for understanding the results and will also outline the theoretical framework of the thesis.

The Alma Ata Declaration (20), issued by the International Conference on Primary Health Care in 1978, underlined the essential role of primary healthcare to achieve the goal of acceptable health for all by year 2000, and urged all governments to plan their healthcare systems accordingly (Textbox 1). Ever since the Alma Ata Declaration was published, the importance of primary healthcare has been increasingly recognized: Healthcare systems with a strong primary care sector are associated with better population health, have better cost effectiveness, slower growth in health expenditures and better functioning healthcare systems overall, thoroughly described by among others Barbara Starfield et al. and Dionne Kringos et al. (21-23). Countries with comprehensive primary care services have lower rates of avoidable hospitalisation (22) and better patient perceived primary care quality (15). The significance of primary care in order to obtain good health and equitable quality in health services for all is further underlined in the 2008 WHO report *Primary Health Care – Now more than ever (24).*

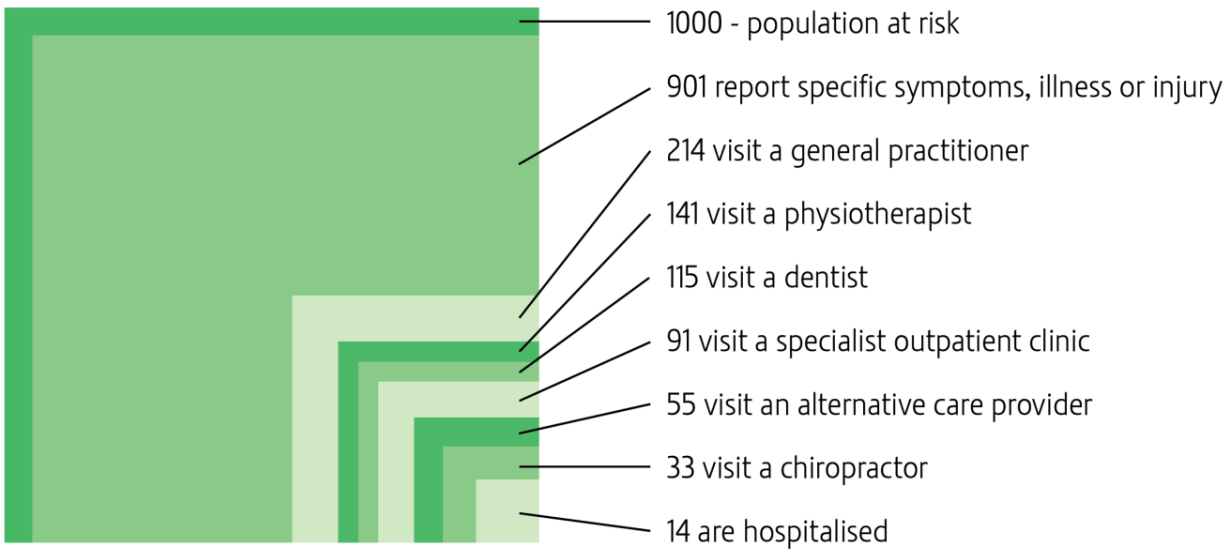
Textbox 1. Excerpt from the Alma Ata Declaration 1978 (20)

- Governments have a responsibility for the health of their people which can be fulfilled only by the provision of adequate health and social measures. A main social target of governments, international organizations and the whole world community in the coming decades should be the attainment by all peoples of the world by the year 2000 of a level of health that will permit them to lead a socially and economically productive life. Primary health care is the key to attaining this target as part of development in the spirit of social justice.
- Primary health care is essential health care based on practical, scientifically sound, and socially acceptable methods and technology made universally accessible to individuals and families in the community through their full participation and at a cost that the community and country can afford to maintain at every stage of their development in the spirit of self-reliance and self-determination. It forms an integral part both of the country's health system, of which it is the central function and main focus, and of the overall social and economic development of the community. It is the first level of contact of individuals, the family, and community with the national health system bringing health care as close as possible to where people live and work, and constitutes the first elements of a continuing health care process.
- All governments should formulate national policies, strategies and plans of action to launch and sustain primary health care as part of a comprehensive national health system and in coordination with other sectors.
- An acceptable level of health for all the people of the world by the year 2000 can be attained through a fuller and better use of the world's resources, a considerable part of which is now spent on armaments and military conflicts.
- The International Conference on Primary Health Care calls for urgent and effective national and international action to develop and implement primary health care throughout the world and particularly in developing countries in a spirit of technical cooperation and in keeping with a New International Economic Order. It urges governments, WHO and UNICEF, and other international organizations, as well as multilateral and bilateral agencies, nongovernmental organizations, funding agencies, all health workers and the whole world community to support national and international commitment to primary health care and to channel increased technical and financial support to it, particularly in developing countries. The Conference calls on all the aforementioned to collaborate in introducing, developing and maintaining primary health care in accordance with the spirit and content of this Declaration.

Already in 1961, White et al. described the classic model of the ecology of medical care, where they estimate that in a population of 1000, during one month 750 persons will experience some kind of illness, 250 will consult a physician, nine will be hospitalized, five will be referred to another physician and only one will be referred to a university hospital (25) . Although the figures have been evaluated and slightly modified over the years, the distribution is surprisingly unaltered (26), illustrating that for most patients primary care will be the sole meeting point with the health services. White´s model has been reconstructed in a Norwegian setting (Figure 1): Hansen et al analysed data from The Norwegian Tromsø study (2007-8) (27), and found that in a population of 1000 Norwegians aged 30 years and over, 901 reported a health problem, 214 visited a GP, 91 visited a specialist outpatient clinic, and 14 were hospitalised.

Figure 1. Monthly prevalence of symptoms and healthcare seeking in a Norwegian adult population.

Hansen et al. J Public Health Res, 2012. 1(2): p. 177-83. Published with permission.



In 1981-1984, Norwegian GP Olav Rutle published several reports about the Norwegian GPs; the equipment they had available in practice (28), why the patients came to see them (29), and different ways of organising the practices and how this affected the GPs work (6) . His studies added valuable information about the diverse practices of the Norwegian GPs and the various reasons for the patient encounters. However, with the 35 years that have passed, much has likely changed due to the change in the organisation of primary care in Norway with the introduction of the regular GP reform in 2001 (30), the expansion of possibilities within medical treatment and possibly also altered patient expectations.

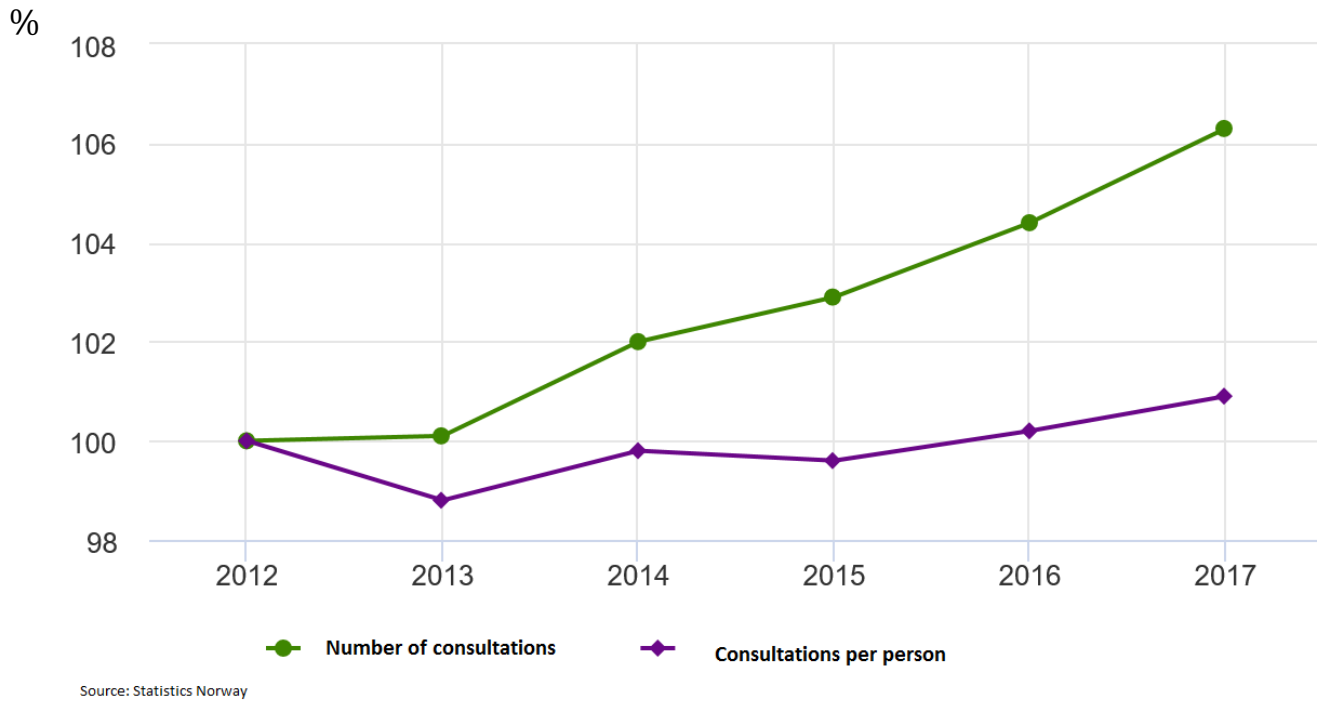
7.2 The Norwegian regular GP system

Since 1984, the Norwegian municipalities have been legally responsible for providing healthcare services to their inhabitants. In 2001, Norwegian health authorities introduced the regular GP scheme ("fastlegeordningen") (30). Each Norwegian inhabitant was registered with one specific GP, the so called regular GP, who should ideally be the first point of contact for all medical issues, to ensure all inhabitants good access to healthcare services. An underlying aim was for medical problems to be handled on the lowest level of efficient and sufficient care.

Provided that there is sufficient capacity in the regular GP scheme, the patients choose their GP freely. Patients´ first encounter with the healthcare system in Norway will in most cases be a visit to their GP. The Norwegian healthcare system enforces strict gate-keeping, where patients have to get a referral from a GP to get in contact with medical specialists working within the public health system, both at hospitals and in hospital-independent specialist clinics. In general, the Norwegian GPs are highly valued by the population: The regular GPs have consistently scored very high on the biannual Norwegian Citizen Survey

("Innbyggerundersøkelsen") since the first survey in 2010, and in both 2015 and 2017 they came second only to the public libraries in terms of the citizens´ general contentment with public services (31). In the years since 2012, there has been a steady, yearly increase of 1.5-2% GP consultations per year (Figure 2). During 2017, 70% of the population had one or more consultations with their GP. The mean number of consultations per inhabitant was 2.7, with a total of 14.4 million GP consultations. (32).Only 0.7% of the population chose not to have a regular GP (33).

Figure 2. Relative increase in number of GP consultations and consultations per person in Norway 2012-2017. 2012=100.



At the introduction of the regular GP reform, there were 3661 regular GPs, increasing gradually to 4814 by December 2018 (33). Each GP was allocated a specified patient list. The standard patient list for full time employment (five days per week) was set to 1500 patients, with a maximum allowed patient list size of 2500. These figures have not been changed since the introduction of the

regular GP scheme. The average size of the patient list is substantially lower than this norm; it has decreased from 1178 in 2010 to 1097 in 2018 (-6.9%)(33). In 2016, 232 regular GPs worked in single GP-practices (34), whereas the rest of the regular GPs worked in group practices, usually with 2-5 GPs. The GPs may also be assigned by the municipalities to work up to one day per week with municipal healthcare services such as well child clinics and nursing homes.

Prior to the reform, it was not uncommon for the GPs to be employed by the municipalities (40% of GPs were on regular salaries in 1990 (35)), whereas immediately after the reform in 2001 this percentage was reduced to 10.2%, with a further reduction to 4.4% in 2014 (33). In September 2017 the number of GPs on regular salaries had increased slightly to 6.6%. The remaining GPs are self-employed and receive a combination of per-capita based fee (486 NOK/ 50 Euro per patient per year in 2018) and activity-based fee-for-service reimbursement (33). The self-employed GPs are relatively independent in terms of how they organise their practices, which medical procedures they offer, what kind of equipment they have available, how much time they spend with each patient, to what extent they employ secretaries/nurses etc. In the original white paper to the Norwegian Parliament regarding the regular GP scheme in 2000 ("Forskrift om fastlegeordning i kommunene") (30), the focus was mainly on the organisation of the GPs, not the content of the services. It briefly states that *"The regular GP is responsible for the provision of general medical services to the persons on his/her patient list",* but these services are not further outlined. In a commented version of this white paper it is stated that *"Patient appointments should be provided within reasonable waiting time (…) The regular GP has the responsibility for (…) individual preventive measures, examination and treatment (….) The people on the regular GP´s patient list should be provided with general medicals services, be referred to specialised services as needed and be issued necessary health certificates*" (all translations by author). However, in recent years health authorities have introduced more specified expectations regarding

which medical services should be provided in general practice, particularly in the Health Coordination Reform in 2012 and the new regular GP regulations in 2013 (2, 36). The Health Coordination Reform aimed to increase the role of primary care in handling patients´ need for health services, including rapid discharge after hospital admittance (2, 37). With this reform, the Norwegian GPs were given an increasingly important role in the follow-up of their patients, and the discussion about the GPs´ role is very much ongoing (38, 39). The tendency towards more central control over general practice services was also seen in a 2015 white paper to the Norwegian Parliament, *The primary health and care services of tomorrow – localised and integrated*, where the government underlined the need for more team-based healthcare services, with the GPs as an essential part of such primary care teams (40).

In 1973, a first step towards a Norwegian specialty in general practice was made possible through registration as a "GP of the Medical Association" ("Allmenpraktiker Dnlf") (41). Since 1985, there has been an officially approved specialty in general practice in Norway, and 59% of the regular GPs are currently (April 2018) specialists (34). The aim for the Norwegian GP specialists has been to deliver services that are *continuous, comprehensive, personal and committed*, condensed into the Norwegian acronym KOPF (41). The Norwegian Medical Association has later raised the discussion whether the KOPF ideal may not be feasible in everyday practice, and in 1990 proposed an alternate set of keywords to describe the ideals of general practice: *coordination, care, prioritisation and prevention* (in Norwegian, this still translates into KOPF) (41). When the regular GP scheme was introduced in Norway in 2001 (30), the Norwegian College of General Practitioners launched their "Seven principles of good medical practice for general practitioners", in order to, among other things, clarify the responsibilities of the GPs, promote appropriate use of medical resources and create realistic expectations of the health services (Textbox 2) (7). When the Norwegian regular GP scheme works as planned, the GP represents a main

source of healthcare continuity for most inhabitants. Continuity of care has been found to be associated with increased patient satisfaction, increased adherence to medication, reduced hospital use, and even with reduced mortality (12).

Textbox 2. Seven principles of good medical practice for GPs. Norwegian College of General Practitioners 2001(7) **English version by courtesy of dr. Anna Stavdal**

1. At the heart of general practice is the relationship between doctor and patient.
2. Do what is most important.
3. Give most to those whose need is greatest.
4. Use words that are health-promoting.
5. Invest in continuing and supplementary education, research and professional development.
6. Describe experiences of practice.
7. Take leadership.

7.3 Patient satisfaction versus patient experience as quality measures

Patient satisfaction has commonly been used as an indicator of the performance of primary care systems or individual healthcare suppliers (42, 43), and by extension a measure of quality. The concept of quality as applied in health services research is often abstract and unclear, and the definitions vary (44). In a systematic review on the breadth of primary care (45, 46), ten core dimensions of primary care were identified, and these were clustered into three main groups:

- *Structure* (governance, economic conditions and workforce development)
- *Process* (access, continuity of care, coordination of care and comprehensiveness of care)
- *Outcome* (quality of care, efficiency of care, equity in health)

In a Norwegian study from 2000, the main aspects of GP consultation as judged by patients were considered to be the interaction with the doctor and the outcome of the consultation (47). In 2009, Norwegian researchers found a positive association between patients´ satisfaction with the access to care and the GPs' service production (number of consultations per person on the GPs' lists), but no association with consultation time or the feeling of being taken seriously by the GP (48).

Patients´ perceived satisfaction with the medical services they receive will to a large extent be coloured by the process features (access, continuity, coordination, comprehensiveness), while it is probably more difficult for lay people to evaluate the medical quality and appropriateness of received care. This means that even when medical quality is poor, patient satisfaction scores may be high if e.g. the accessibility is good or the physician comes across as sympathetic. On the other hand, if the medical quality is in fact high, the patients may give a poor satisfaction score if e.g. the access of care is poor or the doctor and the patient disagree about the actions taken for the medical issue in question. Consequently, over the recent years there has been a shift towards surveying patients´ actual experiences instead of evaluating their reported satisfaction with healthcare services (49, 50). Professor Barbara Starfield, who always advocated the essential role of primary care in healthcare services, stated that "*Understanding people's primary care experiences (rather than or in addition to their satisfaction), including the extent to which they receive the range of services appropriate to their needs and have the care they receive elsewhere coordinated and integrated, are important to evaluating the adequacy of health services"(22).*

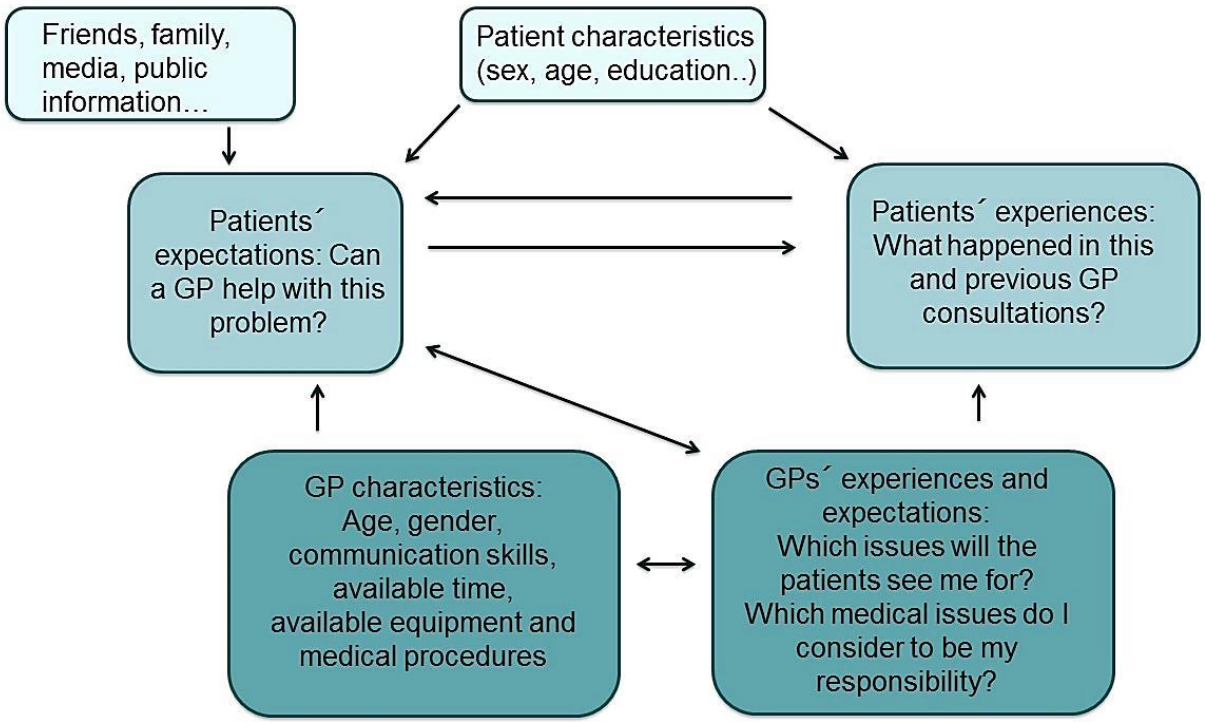
There is a possibility that inhabitants in different countries have different attitudes towards the importance of the various traits of the doctors and the consultation processes. This must be taken into account when comparing the performance of healthcare systems in different countries measured by patient evaluation. Dutch researchers compared patient values in 12 European countries in a study from 2005 (51), asking the patients to rank the importance of 10 aspects of GP interaction. They found that for almost all the countries, the item "the GP should always take me seriously" ranked highest, and the waiting time for appointment ranked lowest in terms of importance, in accordance with the findings in an earlier multinational European study (52). They also found significant inter-country differences in the evaluation of importance for some of the items, and these kinds of differences may influence patient satisfaction even when services are comparable. Therefore, patient reported experiences may be a better tool for inter-country comparisons than patient reported satisfaction.

7.4 Health services use and healthcare seeking behaviour

The behavioural model of health services use was originally developed by Andersen and Newman about 40 years ago, and has later been reviewed and revised several times (53-55). The original model suggests that people´s use of health services is a function of three major components: First, the intrinsic predisposition to use services; secondly, the factors which enable or impede use; and finally, the need for care. The model has over the years been modified, embedding the increasing knowledge about the influence of social networks, social interactions and cultural health beliefs. In newer models, there is also increased awareness of feedback effects, where health outcomes and consumer satisfaction may affect subsequent health seeking behaviour (55). In a British literature review from 1996, the authors conclude that many factors affect

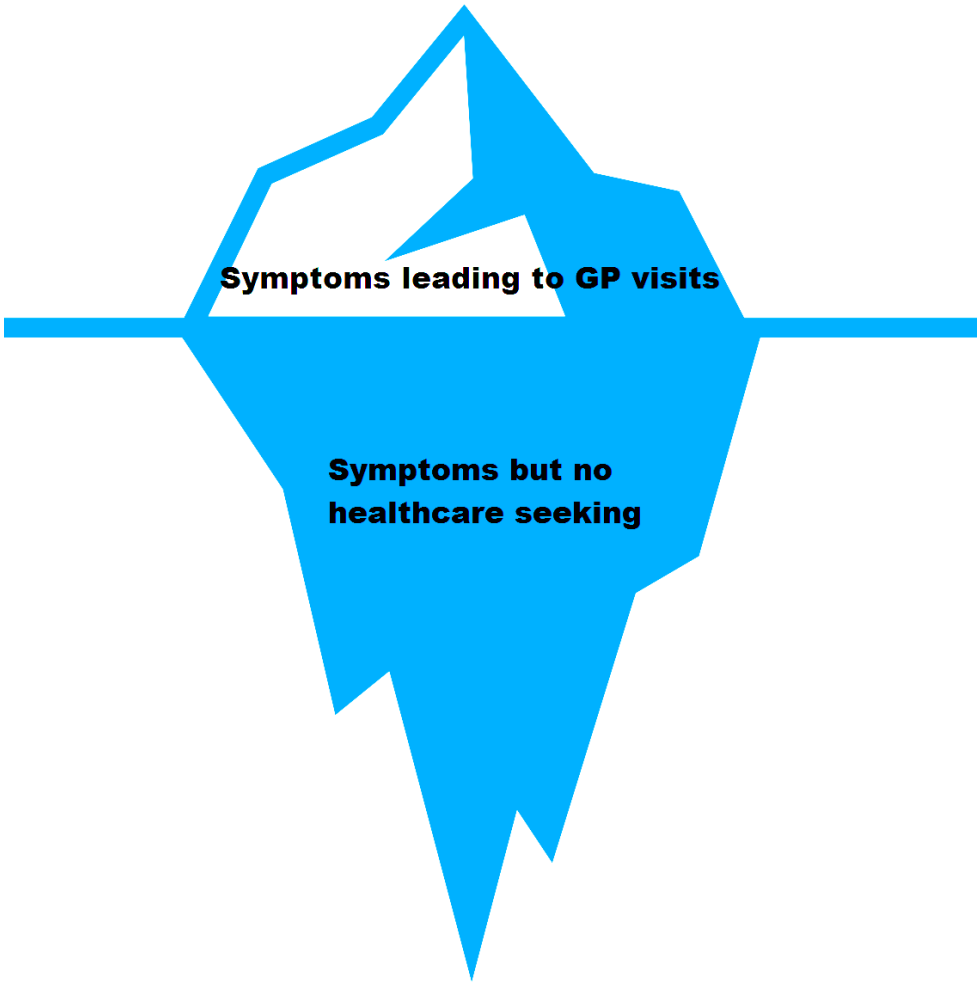
healthcare seeking behaviour: health status, social status, previous knowledge about illness, perceived severity of the illness and benefit of healthcare seeking as well as organisational factors such as distance from surgery and appointment systems (56). Input from social network members has also proved to be an important factor in the decision towards seeking healthcare (57). A review from 2002 concluded that mass media campaigns may influence health services use (58), although a Danish study found no effect on mass media on healthcare seeking in the absence of organised media campaigns (59), and Norwegian researchers found no effect on sickness behaviour from a media campaign on back pain (60). A simplified visual presentation of the theoretical framework of healthcare seeking behaviour is presented in Figure 3.

Figure 3. Patient and GP factors that may influence healthcare seeking behaviour. Inspired by Andersen and Babitsch (53, 55)



At about the same time as the development of Andersen´s behavioural model another key concept of healthcare seeking was launched, namely "The Symptom Iceberg", originally described by J.M. Last in 1963 (61). The iceberg metaphor was originally used to describe how the prevalence of disease known to the average GP only represents the tip of the iceberg with regards to the actual prevalence of disease in the GP´s practice population (e.g. undiagnosed diabetes, lung cancer that has not yet presented with symptoms, latent tuberculosis).

Figure 4. The Symptom Iceberg. Inspired by Last and Hannay (61, 62).



The concept was later operationalized by David Hannay in his analyses of data from the Glasgow Symptom Survey, where he defined the Symptom Iceberg as the prevalence of significant symptoms that lead people to see a doctor (the tip of

the iceberg) as opposed to the actual prevalence of the same symptoms in the population (the submerged part of the iceberg, Figure 4) (62). The iceberg term is still in common use in the research of healthcare seeking behaviour (63-65). In 1978, Norwegian GP Olav Rutle recorded 36 383 direct patient contacts with 379 GPs, thus looking at the visible part of the iceberg (29). Cardiovascular diseases and musculoskeletal conditions were the most common reasons for contact. For women, urogenital disorders and contacts related to pregnancy were common, whereas trauma was more prevalent for male patients. In rural areas, there were more patients with acute diseases and trauma, and more serious chronic diseases than in urban areas. Twenty years later, in a study from north-western Norway, over 90 000 patient contacts with 203 GPs were studied (66). The distribution of contact reasons was very similar to what was previously found by Rutle. The most prevalent reasons were musculoskeletal conditions, airway diseases, cardiovascular diseases, and psychological disorders.

Symptoms and complaints are prevalent in the population. In the Norwegian Ullensaker study (2004) of 3325 individuals, 92% had experienced at least one symptom during the previous week, and mean number of symptoms reported was six (67). Not all symptoms lead to help seeking, as illustrated by the submerged part of the iceberg in Figure 4. In the Norwegian Tromsø study (2007-2008), almost the entire population (901 per 1000) of 30 years or more reported some kind of symptoms or health problems during the course of a month, but only 214 visited a GP during the same period (27). In a British study from 2011, with a random sample of 8000 adults from twenty general practices nationwide, the authors investigated different management strategies for a selection of common symptoms (64). While about 50% of all the symptoms led to no action at all, use of lay-care for minor ailments such as headaches or flu symptoms was common. Only 12% of symptoms led to a consultation with a primary care health professional, mainly a GP, especially for serious symptoms such as blood in the stools or unintentional weight loss. In a Danish nationwide

population study from 2015, 9 out of 10 persons reported at least one symptom the preceding four weeks, but only 37% had contacted their GP (65). The authors underline the need for an increased understanding of healthcare seeking decisions.

In conclusion, the submerged part of the symptom iceberg has been investigated in several studies. However, little knowledge exists on the patients´ expectations to when the GPs may be of help, or on whether GPs and their patients have equal expectations to what patients will seek the GPs for.

7.5 Patients´ and GPs´ different expectations

There is extensive research from many countries, including Norway, regarding the complaints that bring people to the GP (29, 32, 64-72). We have, however, little knowledge concerning the patients´ preconceived believes about what a GP can help them with. Norwegian GP Marit Hafting studied the elderly´s use of healthcare services, but focused mainly on the people who do *not* seek healthcare services (73). Recent figures from Denmark reveal that only about one in five experienced symptoms lead to a contact with the GP (74). Independent of gender and age, symptom concern and the symptoms´ influence on daily activities were significantly associated with the decision to contact the GP. However, the authors did not address the GPs´ expectations regarding which symptoms the patients would seek them for.

Patients´ expectations before a GP visit will be influenced by many factors, such as past experiences with GP consultations, patient stories told by friends and relatives, social media and information from the government or the GP (54, 55). The patients´ experience with and evaluation of a GP consultation will be influenced both by their expectations to the GP´s behaviour and to what the GP

can be expected to assist with, as well as events in previous and the current consultation, partly described by Andersen´s behavioural model (53, 55) and illustrated in Figure 3. Physicians will also have pre-existing notions of what kind of problems patients will seek them for and to what extent they as GPs are expected to be of help. However, GP expectations are less described in literature. A Swiss study from 2015 showed that GPs commonly underestimated the patients´ satisfaction, but overestimated their expectations (75).The study was restricted to a single urban area, thus the external validity is uncertain. In a Norwegian study of antibiotic prescription in an emergency care setting, relatively poor agreement was reported between the patients´ expectations and the GPs´ perception of the patients´ expectations (76). A British study from 2007 similarly showed that GPs´ assessment of their patients´ wish to be involved in decision making correlated poorly with the patients reported preferences (77).

Most people probably have a notion about which conditions that can safely be handled by themselves, thus most minor complaints will not lead people to visit their GP (25, 27). It is reasonable to assume that when someone consults a GP, they expect that the consultation will somehow be of help or benefit to them. At present, we have little systematic knowledge about these expectations. Healthcare systems´ influence on patients´ propensity to seek healthcare has been investigated in a study from the international QUALICOPC material encompassing 34 countries (19). Patients with previous experiences of good access, continuity and good communication with the GP are more likely to seek care, especially for minor complaints. It is also likely that GPs have expectations concerning what kind of complaints and symptoms that will bring their patients to see them. We have, however, not been able to find any research addressing this topic. We also have little knowledge about whether the GPs´ and their patients´ expectations coincide.

7.6 The GP´s consulting room – a chamber of secrets?

In Norway, there is little legislation specifying the medical services the GPs should provide. The regular GP regulations from 2012 states that: "*The regular GP must run the practice in concordance with (...) updated knowledge and national guidelines (...) The regular GP must receive and evaluate all kinds of contacts in the office opening hours(...) The regular GP must, when necessary, refer his or her patients to specialist health services or other primary care services*" (translation by author) (36) Within these rather vague limits, it is largely up to the individual GPs to decide what kind of technical diagnostic and therapeutic equipment they have at their disposal, what kind of medical procedures they choose to perform themselves, and which procedures and medical problems they refer to a relevant specialist. It is generally expected that GPs should care for all common medical issues, perform minor surgery and handle common gynaecological problems, and further provide a practice laboratory offering a selection of point-of-care tests. There is, however, no public registers providing complete information about what the individual Norwegian GPs offer their patients. In spite of several major organisational changes that may well have affected the GPs work, little research has been done in this field since 1983 (28). Reports from other countries are mostly older or less relevant for the current situation in the Nordic countries (78-80). In some studies, focus has specifically been on the presence of one type of equipment (81) or at equipment present at out-of-hour services (82). We lack research that describes the complete selection of services offered in Norwegian GP practices. In the European GP Task Profile Study from 1993, the service profiles in 30 countries, including Norway, was described (83). The Norwegian situation is, however, not described in detail in this study, and the introduction of the regular GP scheme in 2001 (30) and the coordination reform in 2012 (2) may have influenced the service profile of the GPs.

In many aspects, the GP practice therefore still constitutes a “chamber of secrets”, with limited access to detailed information about which medical services the individual GPs offer.

7.7 International comparisons of healthcare systems

Primary care is an important part of the healthcare systems in most Western countries, but the role of the GPs may vary. It is of value to learn from other countries, but structural, organisational and cultural differences must be taken into consideration when interpreting research results (84). Evidence suggets that both a common, international component and a local, healthcare system specific component of general practice exist, implying that international comparions are of interest, but should be supported by local knowledge (85, 86).

The Nordic countries have comparable, but not identical, healthcare systems (87). All five countries base their healthcare systems on the Nordic welfare model, aiming for easy accessible, affordable, high quality healthcare services to all inhabitants. There are, however, some important differences in how the countries organise their primary care services to achieve this goal (Table 1). Denmark and Norway have fairly similar systems, with patient lists and mostly self-employed GPs. In Sweden, Finland and Iceland most GPs are employed by health centres, and the patient affiliation also lies with the centre. Sweden and Iceland have no gate-keeping system (patients do not need referrals from a GP to see a specialist), whereas Norway and Denmark have relatively strict gate-keeping systems, and Finnish patients need referral for hospital specialists. It is probable that these structural differences influence the services provided by GPs in the different countries. The Nordic countries have somewhat similar cultures and political structures, and a comparison of the primary care services may

Table 1. Nordic Primary Healthcare Systems

	GP employment	Patient affiliation	Patient co-payment	Gate-keeping
Norway 5.2 mill inhab. GDP € 49 200 (2013)[a]	Mostly self-employed. Receive a combination of capitation fee and fee-for- service.	Individual patient list system. All inhabitants are assigned to or choose a regular GP.	Co-payment for adults ≥ 16 years.	For all specialities
Sweden 9.8 mill inhab. GDP € 32 700 (2013)[a]	Mostly employees in public (60%) or private health centres.	All patients registered with a primary care centre.	Co-payment for adults ≥ 20 years.	No
Denmark 5.6 mill inhab. GDP € 32 100 (2013)[a]	Mostly self-employed. Receive a combination of capitation fee and fee-for-service.	Patients listed with a general practice. 1% are not listed (group 2-insured)	No co-payment (group 2-insured pay part of the fee and have free choice of GP).	For most specialities. Patients can contact ophthalmologists and ear-nose-throat specialists directly.
Finland 5.4 mill inhab. GDP € 37 559 (2014)[a]	Mostly employees in public/ private health centres or in occupational healthcare.	Patient affiliation with public health centres or occupational healthcare centres. Partly subsidised private services also available.	Co-payment for adults ≥ 18 years in public health centres, variations between municipalities. No co-payment in occupational healthcare.	A referral is needed for hospital specialists. Patients can contact all private specialists directly.
Iceland 329100 inhab. GDP € 30 000 (2013)[a]	Mostly employees in public health centres.	Patient affiliation with health centres.	Co-payment for adults ≥ 18 years. Reduced co-payment > 67 years.	No

[a] Information from the Nordic co-operation www.norden.org/en/fakta-om-norden-1/the-nordic-countries-the-faroe-islands-greenland-and-aaland (January 2017)

therefore give valuable information concerning possible effects of the differences in the organisational structure of the health services.

Starting in 2001, the Commonwealth Fund has carried out an annual international survey of health systems, partly from the perspective of the general population and partly from the perspective of the GPs, with alternating focus areas each year. Norway has been participating in the surveys since 2009. In 2016, the Norwegian respondents from the general population (with a response rate of only 11%) reported poorer experiences than people in other countries with communication, user participation and consultation time (88). The Norwegian report concludes that a separate national study should be considered to evaluate the quality of general practices. The Commonwealth Fund surveys do not give the possibility to investigate associations between the answers from patients with characteristics of their GPs.

8 AIMS OF THE THESIS

The aims of this thesis were to study the services provided by Nordic GPs, to explore the association of organisational factors with patients´ experiences in the GP consultation in a Norwegian setting, and to study possible differences between Norwegian GPs´ and patients´ expectations towards the GPs´ work. In more detail, we aimed to:

- Describe and compare medical services provided by Nordic GPs in terms of available equipment, clinical involvement in medical procedures and the follow-up of common medical conditions (Article I).
- Study associations between patients´ experiences with the communication with their GP and independent characteristics of the GPs and their practices, such as the size of the GP's patient list, the geographical location of the GP's practice, whether the GP is self-employed or not, average duration of consultations, and the doctor's sex and age (Article II).
- Explore for which medical problems patients expect their GP to be helpful, what the GPs expect their patients to consult them for, and whether there are differences between the expectations of the GPs and those of their patients (Article III).

9 MATERIAL AND METHODS

9.1 The QUALICOPC study

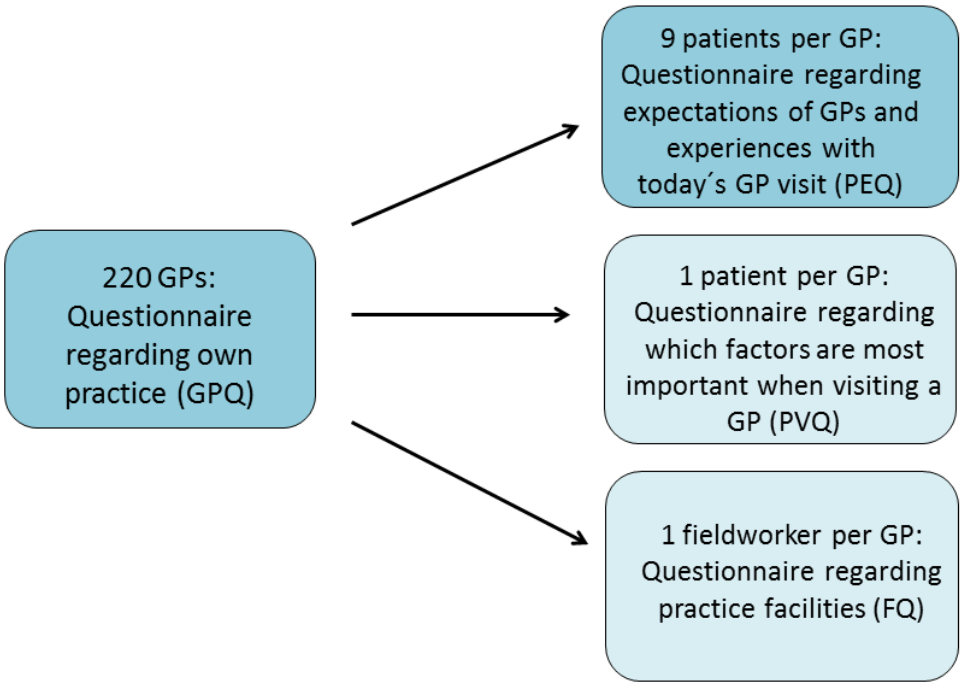
The multinational QUALICOPC study was designed and planned by the Netherlands Institute for Health Services Research (NIVEL) in order to evaluate the performance of different primary healthcare systems in Europe(1). QUALICOPC aimed to describe what strong primary care systems entails, and also the effects primary care systems have on the performance of healthcare systems in terms of quality, equity and costs. QUALICOPC comprises 34 countries: 31 European countries (26 EU countries, Iceland, Norway, Switzerland, Turkey and North Macedonia) plus Australia, New Zealand and Canada (89). QUALICOPC contains (as of 2016) data from 7813 GPs and 69201 patients (15). This thesis is based on the material from the Nordic (article I) and the Norwegian (article II and III) branch of the QUALICOPC study.

A set of four questionnaires was developed by the QUALICOPC Partner Consortium (Figure 5) (90). The survey set consisted of:

1) The GP questionnaire (GPQ) concerning organisational aspects of the GP´s practice, the health problems and procedures handled in the practice and the range of medical equipment available for the GP (data used in article I).
2) The patient experiences questionnaire (PEQ) concerning experiences with one particular GP consultation and with this GP´s practice, and also concerning which health problems the patients expected the GP to be of help with. Nine patients filled in the PEQ per participating GP (data used in article II and III).
3) The patient values questionnaire (PVQ) concerning how the patients valued the different aspects of primary care. Answered by one patient per GP (data not used in this thesis).

4) The fieldworker questionnaire (FQ) concerning the practice facilities (e.g. cleanliness, accessibility for disabled people) (data not used in this thesis).

Figure 5. Questionnaires in the QUALICOPC study



Based on calculations in previous research (1), the QUALICOPC study aimed to include 220 GPs in each country and 10 patients (9 PEQ and 1 PVQ) per participating GP (in Iceland and other small countries, the aim was 75 participating GPs).

The QUALICOPC questionnaires were developed by researchers at NIVEL to enable analyses of the relationship between primary care organisation and outcomes (90). They searched Pubmed and Embase for existing questionnaires published between 1990 and 2010 that have focused on either structures,

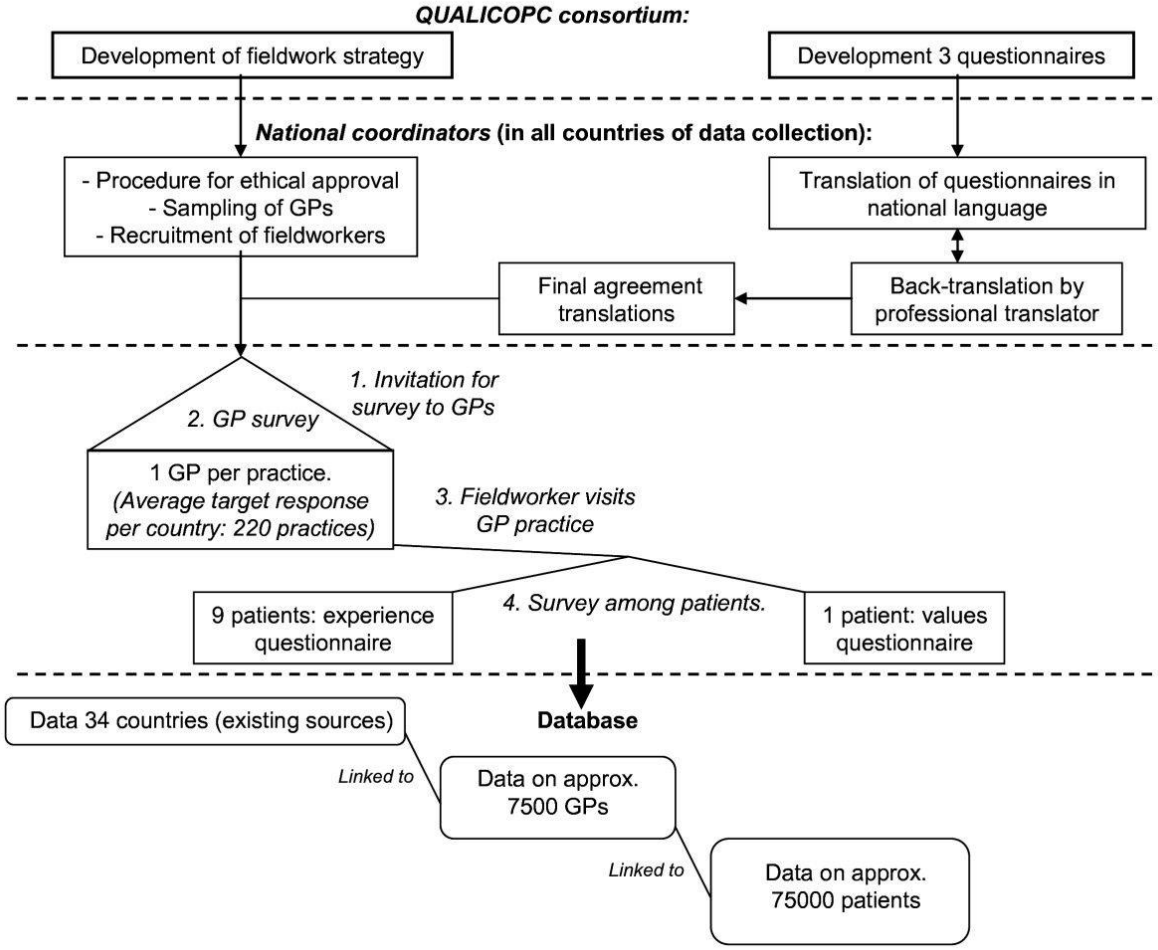
processes or outcome aspects of primary care. The retrieved questionnaires were classified according to which aspects of primary care they were designed to measure. The questions were rephrased as needed, and new questions were made to fill identified gaps in order to cover all aspects that the QUALICOPC researchers aimed to focus on. In three consecutive consensus rounds, the researchers assessed the questions according to established inclusion/exclusion criteria. Finally, a pilot study was done among GPs and patients in Belgium, the Netherlands and Slovenia. Based on the results of the pilot and a last consensus round, the final questionnaires were completed. The process has been described in more detail by QUALICOPC coordinator Willemijn Schäfer et al (90). An overview of the QUALICOPC study protocol is shown in Figure 6. The questionnaires were translated into the languages of the participating countries by a "back and forth" translation procedure. In my thesis, I will use data from the Nordic GPQs and the Norwegian PEQs (Figure 7). The full versions of the questionnaires are found in the appendix.

9.2 Study design

QUALICOPC is a cross-sectional study of primary care in 34 countries. In article I of this thesis we used a comparative design to study differences and similarities of primary care in the five Nordic countries. Article II and III are cross-sectional studies of Norwegian data from GP and patient questionnaires. The study design does not allow for causative conclusions regarding the observed differences and associations.

Figure 6. Overview of the QUALICOPC study protocol

Schafer WL et al. BMC Fam Pract. 2011;12:115. Published with permission.



9.3 Recruitment to the study and data collection

In Sweden and Denmark, random national samples of GPs were invited to participate. Iceland invited all GPs in full time positions at health centres in and around Reykjavík, and in addition a proportion of GPs working full time at selected rural health centres representing all the main health districts across the

country (i.e. West, North, East and South parts of Iceland) (personal communication from Iceland´s national coordinator Ofeigur Thorgeirsson). In Finland, there was a mixed procedure of random sampling plus selected GPs. In Norway, we used a convenience sampling within formal and informal GP networks (both among GPs who supervised medical students and also among continuing medical education (CME) groups for GPs). The general practice research units at all four medical faculties in Norway were involved in recruiting GPs, thus ensuring that we received information from the whole country.

Inclusion of GPs was stopped when a sufficient number of GPs was reached, or when no further recruitment was considered feasible. The GPs received an economic incentive for participation in Denmark (about 100 Euro) and Norway (gift card of about 45 Euro). In Iceland, participants were invited to a seminar (89). In Sweden and Finland, no incentives for participation were offered. Patients did not receive any payment for participation (Table 2).

In each participating medical practice, fieldworkers consecutively invited patients ≥ 18 years of age who had a face-to-face consultation with a participating GP on a randomly selected day. Field-workers were either medical students or health secretaries working in the practice. The patients´ surveys were filled out in the GPs' waiting room on the day of the consultation. All GP and patient surveys were answered anonymously. A unique identification number linked the GPs´ responses to the responses of his/her patients, but there was no link between the ID number and the actual identity of the participants or the GP practice. For each participating GP, nine patients completed the PEQ, one patient completed the PVQ, and one FQ was completed by the fieldworker (Figure 5). In Sweden and Denmark, the FQ was not used. As information from the fieldworker questionnaires is not included in this thesis, this does not influence our results. The implementation of the QUALICOPC study internationally is thoroughly described elsewhere (89).

Data collection in the Nordic countries took place from 2011 to 2013. The recruitment procedure and participation in the Nordic countries are described in Table 2 and further discussed under methodological considerations. In Sweden, less than half of the wanted 220 GPs were recruited. In the four other countries, the reported response rates varied from around ten to more than eighty percent. However, since the number of invited GPs was not the same in each country, the response rates measured as percentage of invited GP are not directly comparable. The obtained number of participants as percentage of the intended number of participating GPs per country is more informative when evaluating participation (Table 2).

In Norway, data collection was done from November 2012 to April 2013. Each of the four Norwegian general practice research units took part in the data collection, recruiting GPs from their geographical area. A total of 204 GPs were recruited (50 by The Arctic University of Tromsø, 50 from Uni Research health Bergen, 47 from the Norwegian University of Science and technology in Trondheim, and 57 from the University of Oslo). Six of the GPs did not return their questionnaire, leaving 198 Norwegian GPs included in the study. The PhD candidate was main coordinator at the Department of General Practice at the University of Oslo, and was also national coordinator in Norway with responsibility for all communication with NIVEL after the data collection.

The questionnaires from the participating countries were sent to NIVEL, where data was prepared for further analyses. The data sets from each country were made available for the national coordinators. For article I, we received permission from the coordinators from the other Nordic countries to access their data.

Table 2. Recruitment and participation in the Nordic countries

Adapted from Groenewegen PP et al. Int J Family Med. 2016;2016: 4929432.

	Sampling procedure	**Recruitment methods**	**Incentives**	**Duration of survey**	**Response rate**	**Recruited GPs by recruitment target (%)**
Norway	Opportunity sampling/ volunteers	Letter, e-mail, telephone, personal contact	Gift cards	6 months	198/500[a] (39.6%)	90%
Denmark	Random national sample	E-mail	98.7 Euro	4 months	212/2000 (10.6%)	96.3%
Sweden	Random national sample	Letter	None	7.5months	97/1000 (9.7%)	44.1%
Finland	Mixed procedure (random sample plus selected GPs	Letter, e-mail, telephone, personal contact	None	12 months	288/1000[a] (28.8%)	130.9%
Iceland	(Almost) entire GP population	Letter and personal contact	Invitation to seminar	3 months	80/95 (84.2%)	106.7%

a) Estimated number of invited GPs

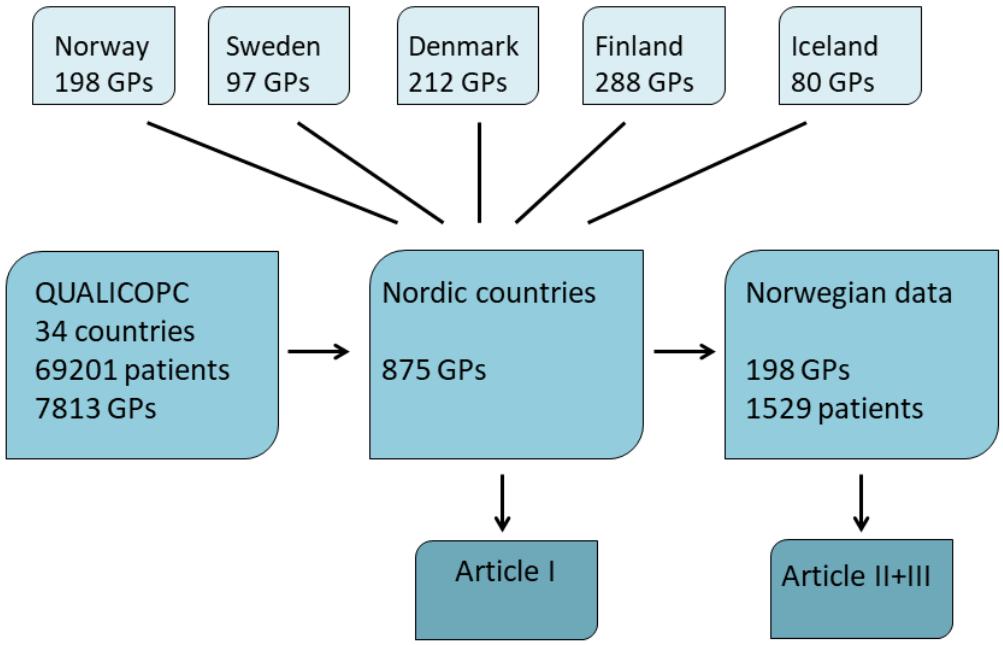
9.4 Participants

We included a total of 875 GPs; 198 from Norway, 212 from Denmark, 97 from Sweden, 288 from Finland and 80 from Iceland (Figure 7). Table 3 shows the demographic details of the participating GPs.

Finland and Iceland obtained more than the required number of participating GPs, whereas Norway obtained 90% and Denmark 96%. In Sweden, only 97 GPs (44% of target) from a limited part of the country agreed to participation in the

study, in spite of several reminders (Table 2). In cooperation with the QUALICOPC coordinators at NIVEL, this was considered sufficient for the analyses.

Figure 7. Study participants in the QUALICOPC study



For all the Nordic countries, age and gender distribution of the GPs were found to be representative for the countries (89).

Our patient material is exclusively Norwegian. It comprises the 1529 patients who answered the PEQ. Table 4 shows their demographic details. The target sample was nine completed PEQs per GP. The mean number of completed PEQs per GP was 7.5 (median 8.0). For 92 GPs (45.3%) we obtained the required nine completed PEQ.

Table 3. Demographics of participating GPs in the Nordic part of the QUALICOPC study

		Norway	Denmark	Sweden	Finland	Iceland
Total	**(N)**	198	212	97	288	80
Female[a]	**(%)**	39	43	55	71	28
Age[a]						
	Mean	45.7	53.1	52	45	54.5
	Range	28-69	35-76	34-69	25-70	33-68
Location	**(%)**					
Big inner city		34	27	15	16	38
Suburbs		14	20	28	19	37
(Small) town		22	24	26	23	9
Mixed urban-rural		16	19	26	22	14
Rural		14	10	5	20	2
Distance to hospital >20 km[b] (%)		28	20	33	32	12
Self-employed[d] (%)		93	99	14	5	9
Size of patient list[e,]						
	Mean	1093	2099	6192	2582	2423
	Range	250-1800	650-25000[x]	500-25000[x]	200-65000[x]	700-17000[x]
Consultations per day[f,y]						
	Mean	19	23.8	13	12.7	13.2
	Range	2-30	12-40	7-25	2-40	7-25
Duration of regular consultation[f,y] (minutes)						
	Mean	18.6	14.3	24.1	23.9	19.3
	Range	10-30	7-20	15-30	10-60	10-30

[a-g] Number of missing values: [a] 2; [b] 11; [c] 18; [d] 19; [e] 33; [f] 13; [g] 9

[x] Some GPs have probably reported the size of the entire practice population rather than their individual patient list.

[y] Estimated by the GPs.

Table 4. Demographics of 1529 participating Norwegian patients.

	Total N (%)	Women N (%)	Men N (%)
Total	1529 (100)	916 (61.9)[a]	564 (38.1)[a]
Age[b]			
Range	18-93	18-91	18-93
Mean	48.7	46.2	52.5
Education[c]			
Primary school	194 (13.4)	118 (13.1)	75 (13.8)
High-school/college	591 (40.8)	355 (39.4)	236 (43.3)
Higher education	663 (45.8)	429 (47.6)	234 (42.9)
Visited their regular GP?[d]			
Yes	1321 (89.1)	796 (89.3)	482 (88.6)
Patients with a chronic condition[e]	764 (51.1)	445 (49.6)	289 (52.7)
Patients´ evaluation of own health[f]			
Very good	243 (16.2)	164 (18.3)	73 (13.2)
Good	741 (49.4)	428 (47.7)	289 (52.4)
Fair	382 (25.5)	222 (24.7)	149 (27.0)
Poor	133 (8.9)	84 (9.4)	41 (7.4)

[a-e] Number of missing values: [a] 49; [b] 59; [c] 81; [d] 51; [e] 34; [f] 30

9.5 Statistical analyses

9.5.1 Variables and data processing

The independent demographic variables used in the three articles are listed in Table 5.

Table 5. Independent variables used in Article I-III

Variable	Article I	Article II	Article III
Patients´ gender and age		X	X
Patient consulted regular GP		X	
GPs´ gender and age	X	X	X
Geographical location of practice (urban/rural)		X	X
Practice distance to hospital	X		
Size of patient list		X	X
GPs´ type of employment	X	X	
Group- or single practice	X		
Number of consultations per day, estimated by GP	X		
Average duration of consultations, estimated by GPs	X	X	

During analyses, continuous independent variables were recoded into categorical variables (Article II and III). The age of the GPs and the patients were split in three groups according to the distribution of the material. The size of the Norwegian GPs´ patient lists was categorised into three groups: ≤900 (small list), 901-1300 (medium list) and >1300 (large list). The categories were partly based on the distribution of the material, partly on the fact that the Norwegian average list size at the time was 1150, and partly on clinical experience. The figures concerning the size of the patient lists in Norway are unambiguous since the patient list is designated to each individual GP. The information concerning list

size from the other Nordic countries lacked sufficient precision to be included in further analyses. The wide range of the figures for list size (Table 3) implies that some GPs have given the number of patients allocated to the whole practice or health centre, not only the list of the individual GP.

The geographical location of the practice was dichotomised: big city, suburbs and small towns were grouped as Urban, whereas mixed urban/rural and rural were grouped as Rural.

The dependent variables analysed in articles I-III are listed in Table 6-8. All analyses were done using IBM SPSS Statistics version 22 (SPSS Inc., Chicago, IL).

Table 6. Dependent variables (from GPQ) used in Article I

To what extent are the following activities carried out in your practice population by you (or your staff) and not by a medical specialist (practice population means: people who normally apply to you for primary medical care)?	
	Answer categories
Wedge resection	"Usually" or "always" versus "occasionally" or "seldom/never"
Wound suturing	
Removal sebaceous cyst	
Excision wart	
Insertion intra-uterine device	
Fundoscopy	
Joint injection	
Strapping ankle	
Cryotherapy warts	
Intravenous infusion	
To what extent are you involved in the treatment and follow-up of patients in your practice population with the following diagnoses?	
Bronchitis	"Usually" or "always" versus "occasionally" or "seldom/never"
Pneumonia	
Myocardial Infarction	
Heart failure	
Rheumatoid arthritis	
Parkinson´s disease	
Diabetes type 2	

Peptic ulcer	
Disc herniation	
Depression	
Hordeolum	
Peritonsillar abscess	
Please tick the equipment used in your practice by yourself or your staff.	
Hemoglobinometer	
Blood glucose test	
Cholesterol meter	
Blood cell counter	
Ophthalmoscope	
Proctoscope	
Otoscope	
Gastroscope	
Sigmoidoscope	
X-ray	
Ultrasound	
Microscope	
Audiometer	
Bicycle ergometer	
Eye tonometer	
Peak flow meter	
Spirometer	
Electrocardiograph	
Blood pressure monitor	
Infusion set	
Doctor´s bag	
Urine catheter	
Coagulometer	
Set for minor surgery	
Suture set	
Defibrillator	
Disposable syringes	
Disposable gloves	
Refrigerator for medicines	
Resuscitation equipment	

Table 7. Dependent patient variables (from PEQ) used in Article II

Think about the consultation that you just finished. Do you agree with the following?	
	Answer categories
The doctor was polite	Yes/No
The doctor listened carefully to me	
The doctor asked questions about my health problem	
The doctor took sufficient time in today´s consultation	
The doctor hardly looked at me when we talked	
I couldn`t really understand what the doctor was trying to explain	
After this visit, I can cope better with my health problem/illness	

Table 8. Dependent variables (from GPQ and PEQ) used in Article III. Items marked with an asterisk were included in comparative analyses between GPs and patients.

Question to GPs: In case of the following health problems, to what extent will patients in your practice population contact you as the first doctor?	
	Answer categories
Child with severe cough*	"Usually" or "always" versus "occasionally" or "seldom/never"
Man 24 Stomach pain*	
Woman 60 Deteriorated vision*	
Man 35 Sprained ankle*	
Woman 60 Polyuria	
Woman 60 Acute paresis	
Man 70 Joint pain	
Woman 75 Memory problems	
Child 8 Hearing problems	
Man 28 First episode of convulsions	
Man 24 Chest pain	
Woman 50 Lump in the breast	
Woman 18 Contraception	
Man 32 Sexual problems*	
Child 13 Physical abuse	
Man 45 Anxiety*	
Relationship problems*	
Woman 50 Psychosocial problems	
Man 52 Alcohol problems	
Question to patients: Would most patients see their GP for the following conditions?	
Child with severe cough*	"Yes" or "probably yes" versus "no" or "probably no"
Stomach pain*	
Deteriorated vision*	
Sprained ankle*	
Cut finger, need stitches	

Wart removal	
Blood in stool	
Help to quit smoking	
Sexual problems *	
Domestic violence	
Anxiety *	
Relationship problems*	
Routine health cheque	
Advice for choosing hospital/specialist	
Question to patients: How important would it be for you to see a doctor if you had…	
Weight loss >2 kg in one month	“Extremely important” or “rather important” versus “somewhat important” or “not important”
Shortness of breath	
Chest pain when exercising	
Headache > 1 day	
Abdominal pains > 1 day	
Loss of consciousness/fainting	
Severe worries > 1 month	
Question to patients: Do you expect to benefit from a visit to your GP for…..	
Stomach problems	Yes/No
Diarrhoea	
Shoulder/neck pain	
Headache	
Flu	
Sore throat	
Feeling nauseous	
Feeling tired	
Feeling nervous	
Question to patients: Do you agree with the following statements?	
In general, doctors can be trusted	“Strongly agree” or “agree” versus “disagree” or “strongly disagree”.
In general, people can be trusted	

9.5.2 Analyses in Article I

Data from the different countries are presented as descriptive statistics, with numbers, valid percentages, range (min-max) and 95% confidence intervals (CI). To identify differences between general practice in the different countries, we used binary logistic regression adjusted for GPs´ sex and age, number of consultations per day and distance to the nearest hospital. We compared each country to all other countries in four separate regression models, changing the reference country for each model (table 4 in the article). To adjust for this multiple testing with four separate models, we used the Bonferroni correction to compute $\alpha = 0.05/4$, giving a significance level of $p \leq 0.0125$ for the logistic regression analyses. For the other analyses, significance level was set at $p \leq 0.05$.

9.5.3 Analyses in Article II

The dataset for Article II has a hierarchical, two-level structure, with up to nine patients "belonging to" each GP. This means that the analyses had to take into account a possible clustering effect. Each cluster of patients may have similarities to each other that diverge from their relations to the other participating patients due to e.g. previous experiences with their GP or the location of the practice. To account for this possible cluster effect, we used a generalized estimating equation (GEE) logistic regression model. This modelling technique helped to account for the variability in patients' experiences between the different GPs and to establish any variation at the GP level. Significance level was set at $p<0.05$.

9.5.4 Analyses in Article III

A binary logistic regression model was used to analyse patients' and GPs' responses by their gender, age and practice location, and, for GPs, by their patient list size.

To explore possible differences in patients´ and doctors´ expectations, we identified seven comparable items from the GPQ and PE (marked with an asterisk in Table 8). Due to the clustered structure of the material, with patients nested within GPs, we used the GEE logistic regression model, correcting for patients´ and GPs´ sex and age, and also for the practice location and size of patient list of the GP that the patient had visited.

To correct for multiple testing, we conducted a Bonferroni correction based on the maximum number of tests for one questionnaire item (which was 19, see Table 8). After calculating $\alpha=0.05/19= 0.0026$, significance level was set at $p\leq 0.002$. As the Bonferroni correction is considered a conservative method with increased risk of type II errors, results with $p<0.05$ are also indicated in the article´s tables. Odds Ratios and percentages are given with 95% confidence intervals.

9.6 Ethics

For the Norwegian part of the QUALICOPC study, ethical approval was applied for through the Regional Committee for Medical and Health Research Ethics in South-Eastern Norway. However, the committee concluded that their approval was not required for this study. Registration at the Norwegian Centre for Research Data (NSD) was not needed as the project only encompassed anonymous, non-sensitive data with no possibility for identification of the participants (91).

The QUALICOPC study was presented to the relevant ethics committees in the other Nordic countries. The study was approved by the Ethical Committee of the Pirkanmaa Hospital District in Finland, the Regional Ethical Review Board of

Linköping in Sweden, and the Icelandic National Bioethics Committee. According to Danish law, the data collection did not need an ethical approval.

Patients and GPs were given oral and written information about the study before inclusion (see appendices). All data from both patients and doctors were collected anonymously. There was a unique identification number that linked the data from the patients (PEQ, PVQ) to the GP (GPQ) they attended, but neither the patients, the GPs, nor the name of the practices could be identified in the recorded data sets.

The international coordinators of the QUALICOPC study at NIVEL have given their consent to the use of the QUALICOPC data in this thesis. The national coordinators of the QUALICOPC study in Iceland, Sweden, Denmark and Finland have consented to the use of their countries´ data for comparative analyses in this thesis.

9.7 Funding

The QUALICOPC study was co-funded by the European Commission under the Seventh Framework Program (FP7/2007-2013) under grant agreement 242141. The thesis was funded by The Norwegian Committee on Research in General Practice (AFU) and the Norwegian Research Fund for General Practice (AMFF).

9.8 Disclosure

The author and the supervisors report no conflict of interest with regard to the QUALICOPC study or the content and conclusions of this thesis.

10 SYNOPSIS OF THE ARTICLES

10.1 Article I

Differences in medical services in Nordic general practice: a comparative survey from the QUALICOPC study

Eide TB, Straand J, Björkelund C, Kosunen E, Thorgeirsson O, Vedsted P, Rosvold EO.
Scand J Prim Health Care. 2017;35(2):153-61.

Aim: To describe and compare medical services provided by Nordic GPs in terms of available equipment and clinical involvement in medical procedures and the follow-up of patients with common medical conditions

Design: A comparative analysis of selected data from the Nordic part of the QUALICOPC study. 875 Nordic GPs (198 Norwegian, 80 Icelandic, 97 Swedish, 212 Danish and 288 Finnish) answered questionnaires regarding medical services offered in their practises.

Results: GPs in the Nordic countries were generally well equipped, performed a wide spectrum of medical procedures and were involved in the follow-up of a wide selection of diagnosis, but with a substantial variation between countries. The Finnish GPs had more advanced technological equipment than any of their Nordic colleagues (e.g. ultrasound 58%, x-rays 63%, gastroscope 29%). Heart defibrillators were less commonly available in Norway (65%) and Denmark (37%) than in the other countries (Sweden 97%, Finland 96%, Iceland 96%). Ninety per cent of Norwegian GPs inserted intra-uterine devices (IUDs), and were more likely to do this procedure than GPs in all the other countries except Denmark (Sweden OR 0.02 [95% CI 0.01-0.1], Finland OR 0.2 [0.1-0.4], Iceland OR 0.02 [0.01-0.1]). Norwegian GPs were less likely to perform wedge resection of toe nails than GPs in all the other countries except Denmark (Sweden OR 14.9

[5.4-41], Finland OR 10.7 [5.7-19.9], Iceland OR 4.8 [2.2-10.8]). Compared with Norwegian GPs, the GPs from all the other countries except Finland were less likely to be involved in the follow-up of rheumatoid arthritis (Sweden OR 0.3 [0.2-0.6], Denmark OR 0.2 [0.1-0.4], Iceland OR 0.2 [0.1-0.3]). Icelandic GPs were also less likely than Norwegian GPs to be involved in treatment of myocardial infarction (OR 0.2 [0.1-0.3]), heart failure (OR 0.2 [0.1-0.5]), Parkinson´s disease (OR 0.1 [0.1-0.3]) and peritonsillar abscess (OR 0.3 [0.2-0.5]).

Conclusion: There was no clear pattern of GPs in one country doing consistently more procedures as well as having consistently more equipment and treating a larger diversity of medical conditions than GPs in the other countries. Icelandic GPs reported involvement in a more narrow selection of medical conditions than GPs in the other Nordic countries. The GPs in Norway and Denmark, where most GPs are self-employed, seem to work in a more similar manner than the GPs in Finland, Sweden and Iceland, where most GPs are employees. In addition to the GPs´ employment status, the existing differences may be associated with variations in remuneration systems and other organisational factors or geographical differences.

10.2 Article II

Patient experiences and the association with organisational factors in general practice: Results from the Norwegian part of the international, multi-centre, cross-sectional QUALICOPC study

Eide TB, Straand J, Melbye H, Rørtveit G, Hetlevik I, Rosvold EO
BMC Health Serv Res. 2016;16(1):1-9.

Aim: To investigate to what degree organisational factors and GP characteristics are associated with patients´ communicative experiences in a GP consultation.

Design: Data from the Norwegian part of the QUALICOPC study. A total of 198 Norwegian GPs completed a survey regarding organisational aspects of their own practice, and 1529 patients completed a survey concerning experiences in a consultation with a GP. Main outcome measures were seven statements concerning how the patients experienced the communication with the GP during the consultation.

Results: 98 % of the patients stated that the GP was polite and listened carefully, and 91 % felt that the GP used sufficient time on the consultation. Seven percent stated that the GP hardly looked at them while they talked, and eight percent couldn´t really understand what the GP was explaining. Both short and long patient lists were associated with negative communication experiences in the consultation with the GP. Compared with patients who saw GPs with a medium sized patient lists (900-1300), those who visited GPs with a short patient list (≤900) had lower odds for responding that the GP was polite (OR 0.2 [95% CI 0.1-0.7]), that the GP asked questions about the health problem (OR 0.6 [0.4-1.0]) and that the GP took sufficient time (OR 0.5 [0.3-0.9]). The patients who met with a GP with a long patient lists (> 1300) had higher odds than patients of GPs with

medium sized patient lists for reporting that the GP hardly looked at them (OR 1.8 [1.0-3.0]) and lower odds for reporting that they could cope better with their problems after the visit (OR 0.5 [0.3-0.9]). Compared with the middle age group (30-65 years), the oldest patients (>65 years) were more likely to state that the GP hardly looked at them (OR 1.7 [1.0-2.9]) and that they couldn´t understand the GP´s explanation (OR 2.0 [1.1-3.4]), but they were still more likely to feel that they could cope better with their health problems after the GP visit (OR 4.7 [1.8-12.3]).

Conclusion: Norwegian patients reported predominantly positive experiences when consulting a GP. Our study suggests that from the patients´ point of view, it is preferable for GPs to have a medium size patient list to allow for a positive communicative experience in the consultation.

10.3 Article III

Patients´ and general practitioners´ expectations regarding patients´ help-seeking behaviour: a Norwegian comparative study.

Eide TB, Straand J, Rosvold EO
BJGP Open 13 November 2018; bjgpopen18X101615.

Aim: To investigate patients´ and GPs' expectations concerning patients' help seeking behaviour in primary care, and to make comparisons between the two.

Design: Data from the Norwegian part of the QUALICOPC study. A total of 198 Norwegian GPs completed a survey regarding their own practice, and 1529 patients completed a survey concerning experiences with and expectations to a consultation with a GP. The GPs were asked to what extent they believed that their patients would contact them given a selection of health problems/symptoms. Presented with a list of health problems and symptoms, the patients were asked whether they believed that most patients with such health problems/symptoms would see their GP, whether they expected to benefit from this visit to their GP, and how important it would be for them to see their GP.

Results: Almost all the GPs expected their patients to see them for common somatic complaints (e.g. cough 99%, stomach pain 97%, joint pain 97%, memory problems 93%). For different psychosocial problems, the GPs expected patients to see them for some problems (e.g. anxiety 95%, alcohol problems 60% and sexual problems 73%), while to a lesser degree for others (e.g. relationship problems 40% or child abuse 39%). Older patients (>65 years) found it more important to see a GP compared to the middle age group (30-65 years) for certain health complaints (e.g. headache OR 1.7 [95% CI1.3-2.2]) and expected to benefit more from a GP consultation (e.g. stomach problems OR 3.5 [1.7-7.4]).

Male and female patients differed in their belief about which symptoms patients would see their GP for and to what extent they would benefit from a GP consultation. Compared with female patients, male patients were less likely to believe that most patients would see their GP for a selection of symptoms (e.g. anxiety OR 0.4 [0.3-0.6]), and more rarely believed that they would benefit from a GP visit (e.g. feeling tired OR 0.6 [0.4-0.8]), but the male patients still found it more important to see a doctor in the presence of some common health complaints (e.g. headache OR 1.5 [1.2-1.9]). The GPs were more likely than their patients to answer that people will usually see their GP when experiencing deteriorating vision (OR 4.2 [2.5-6.9]), anxiety (OR 3.0 [1.5-6.0]) or sexual problems (OR 1.8 [1.3-2.6]).

Conclusion: Patients´ age and gender are associated with their anticipation regarding what a GP can help them with. Norwegian GPs may overestimate to what degree their patients will see them for a variety of common medical problems. This implies a need for more information to the population concerning which services GPs offer. A more comprehensive discussion about which services that should and should not be offered in GP practices is warranted.

11 DISCUSSION

11.1 Methodological considerations

11.1.1 The QUALICOPC questionnaires

The QUALICOPC study and its questionnaires were planned and designed as a large, multinational study (90). Therefore, even though the questionnaires were developed through a thorough validation process before the implementation of the international study (90), they were not specifically designed or validated for a Nordic or Norwegian setting. Inclusion or alteration of some variables would likely have added to the value of the present study. In Norway it would have been reasonable to ask whether the GPs were certified specialists in family medicine. It would also have been of interest to know how many days per week the GPs worked in clinical practice, as many GPs in Norway do not see patients five days per week due to additional employment in the municipalities or elsewhere.

The Nordic geography and demography would have warranted a different categorization of *distance to the nearest hospital* than the one employed by QUALICOCP; in the questionnaires the maximum value was > 20 km, which in large parts of Norway, Finland and Sweden is not considered very far. This lack of details regarding the GPs with the longest travel distance to hospitals may have masked some of the possible differences between urban and rural general practice. In article II and III, we therefore used the GPs´ characterization of the area they work in (urban versus rural) as a proxy, assuming that most rural practices will be situated further away from a hospital than urban practices.

Some of the items included in the check list for technical equipment may be perceived as redundant from a Nordic viewpoint (e.g. refrigerator, disposable gloves, syringes), while others would have added interesting information (e.g. C-reactive protein and other point-of-care tests).

Both the GPs and the patients were asked to indicate from a predefined list of common health problems what kind of problems they believed that most patients would seek a GP for. The GPs were also asked to indicate the diagnoses for which they were involved in treatment/follow-up, and the medical procedures they performed (Table 6 and Table 8). The selection of items in these lists was done by the NIVEL researchers in the process described in chapter 9.1. The selection was based on previous studies, among others the European GP task profile study (83). It has not been possible to find a detailed description on how the items were selected and which considerations that were done when including and excluding different items. If the questionnaires had been constructed solely for this thesis, a more systematic approach to the selection of variables in order to better cover the spectrum of the everyday work of Norwegian GPs would have been valuable and should be considered in future studies.

In Article III, we compared responses from the GPs and their patients regarding anticipated healthcare seeking behaviour. The GPQ and PEQ did not have identical lists of medical issues/health problems, and therefore only seven of the items were considered comparable and thus possible to fit for statistical analyses (Table 9). Moreover, the phrasing of the questions was not identical in the GPQ and the PEQ. The GPs may have perceived the question to encompass only patients that had already decided to seek healthcare, and therefore answered whether they believed that these patients would see the GP as opposed to other healthcare providers. This should, however, not imply a major limitation in a Norwegian setting; with a relatively strict gate-keeping system, the GP will be the first point of contact with the healthcare system regardless of the health complaint. Even for the patients, a similar ambiguity was present in the phrasing of the question, since it was not clearly stated whether the question referred to people who have already decided to seek healthcare or not. This is unfortunate, but since the ambiguity is present both for the GPs and patients, it is less likely that it has led to major systematic errors in the results.

Table 9 Items from the GP and patient questionnaires that were compared in regression analysis

PEQ	GPQ
Would most people visit a GP for the following?	**In case of the following health problems, to what extent will patients in your practice population contact you as the first healthcare provider? (Only first contact, not for further diagnosis or treatment).**
Child with severe cough	Child with severe cough
Stomach pain	Man 24 years with stomach pain
Deteriorated vision	Woman 60 years with deteriorating vision
Sprained ankle	Man 35 years with sprained ankle
Anxiety	Anxious man 45 years
Relationship problems	Couple with relationship problems
Sexual problems	Man 32 years with sexual problems

On a positive note, the analyses of the Norwegian and Nordic data provided the opportunity to reveal more detailed information from the national datasets than what is apparent in the large multinational comparative primary analyses.

11.1.2 Representativeness of the material

The recruitment procedure for GPs in the QUALICOPC study may be considered suboptimal in terms of obtaining a random selection in some participating countries. The Norwegian GPs participating in the study was a convenience sample recruited through formal and informal networks connected to the four participating research units, and as such do not necessarily form a representative sample of Norwegian GPs. The GPs were, however, recruited from various geographical regions throughout the country, thus including both urban and rural GP practices. In our material the gender distribution and the number of

self-employed GPs was representative for the national average at the time of inclusion (33) (Table 10).

Table 10 Norwegian GP study population compared to national average

		Norwegian study population	All Norwegian GPs 2013[a]
Total	**(N)**	198	4387
Female	**(%)**	39	38.6
Age	**(mean)**	45.7	48.1
Self-employed	**(%)**	91.4	95.3
Size of patient list	**(mean)**	1093	1150

a) Source: Statistics Norway

The average size of the patient lists was slightly smaller in our material than the national average (1093 versus 1150). A possible explanation for this difference in list size, albeit small, is that quite a few of our participating GPs had an affiliation with one of the universities in addition to their work as a GP, and therefore spend less time in their clinical practice. The differences between our sample and the national averages are small, and we consider our material to be representative of the Norwegian GP population. We recruited 198 GPs from Norway, i.e. 90% of the intended 220. This was considered sufficient for use in statistical analyses by the QUALICOPC study board at NIVEL (89).

As outlined in section 9.2, the recruitment of GPs varied somewhat across the Nordic countries. Iceland invited a representative selection of GPs and obtained an 85% participating rate, thus ensuring very good representativeness of the national GPs. In contrast, although a random national sample was invited in Sweden, only 10% responded, resulting in a final sample of 44% of the intended number of GPs from a limited geographical area (Table 2). The Swedish results

should therefore be interpreted with care. In Denmark, a random national sample was invited, and they obtained 96% of the intended number of GPs. In Finland, they used a mixed procedure of both random selection of invited GPs plus opportunity sampling, and they obtained 131% of the intended number of participants. As the recruitment methods were different in the different countries, the participation rate across countries cannot be directly compared. The recruitment of GPs was stopped when a sufficient number of participants was obtained or when no further recruitment was considered feasible. In all the Nordic countries apart from Sweden, the participants were recruited nationwide, and distribution of age and gender was representative for the countries (89).

The participating patients were recruited in the Norwegian GPs´ waiting room. The patient study population therefore represents Norwegian men and women who have chosen to seek primary healthcare, and is thus not necessarily representative of the general population. Although as many as 70% of Norwegians see their GP one or more times per year (32), the waiting room population will include more frequent visitors to the GP than the average population. As expected in a waiting room population, the included patients had higher prevalence of chronic health problems and a poorer self-reported health than the average Norwegian population (Table 11). Their level of education was also higher in our material than that in the general population. One possible reason for this is that the recruitment was partly done in practices near cities with universities, where the population tend to have higher education than the general population. Persons with higher education may be more likely to consent to participate in research projects. They may also have higher competence on self-care when ill, and may therefore underestimate when most people will seek a doctor (article III). On the other hand, their expectations to receive an explanation for health complaints may be higher, which could make them more motivated to seek a GP when ill. Even when considering these possible

confounding effects, it is not likely that the differences in education level have caused systematic errors in the results.

Table 11. Patient study population compared to Norwegian average

	Norwegian study population	Norwegian average 2015[a]
Self-reported health good/ very good (%)	65.6	75
Long-term illness/ health problems (%)	51.1	34
Level of education (%)		
Primary school	13.4	26.5
High-school/college	40.8	40.6
Higher education	45.8	32.9

a) Source: Statistics Norway

In this thesis, the focus is mainly on Norwegian general practice. In article I, data from general practice in the other Nordic countries are also included in the analyses. It can be argued that the results may be of limited relevance for general practice in countries outside the Nordic region, in particular with regards to patients´ expectations towards their GPs. The organisation of primary healthcare services varies between countries, and this may affect both the services offered, the expectations the patients have to the healthcare services, and their communication with the GP. In a system where the inhabitants can see an ophthalmologist without a referral, GPs may be less likely to have an ophthalmoscope or eye tonometer, and patients will probably be less inclined to seek a GP when they are worried about eye symptoms. In some healthcare

services systems, other occupational groups have been allocated some of the tasks that in Norway are usually assigned to the GP, for instance insertion of IUDs by midwifes or nurses. Clearly, this will also affect the patients´ and doctors´ expectations. However, even if some of the specific conditions that the GPs are expected to handle to some extent may vary between countries, the presence of an expectation inconsistency between GPs and their patients is not likely to be a strictly Norwegian phenomenon.

11.1.3 A GP doing research on general practice – strength or weakness?

As both a GP as well as a researcher in general practice, I am influenced by my own clinical experiences as a GP in both a rural and an urban setting as well as my preunderstanding of what constitutes high quality primary care. The research questions I identified as relevant and interesting for this thesis, and my interpretation of the results, were therefore influenced by my previous knowledge and experiences. This may entail both strengths and limitations. My familiarity with the research field helped me to plan the study and to interpret the data. However, I am also under the risk of restricting my understanding to fit the framework of my own work experience. An awareness regarding these aspects of phenomenology and hermeneutics is relevant in all research, both quantitative and qualitative (92). In qualitative research, reflexivity is part of the established methodology. In quantitative research, like this thesis, the researcher´s preconceptions and presuppositions are usually not accounted for as part of the methodology nor as a conflict of interest. Nevertheless, it is still relevant and important to keep this in mind both when identifying research questions and interpreting results.

As accounted for in chapter 9.1, the questionnaires that provide data were designed mainly by researchers in central parts of Europe. The selection of dependent and explanatory variables from the dataset was done by myself in cooperation with the co-authors and supervisors, within the scope allowed by the QUALICOPC questionnaires. Both the identified research topics, the identification of relevant variables and the interpretation of the results may have been affected by the presuppositions and previous experiences of the research group. I have several years of experience both from urban and rural general practice, and I have strived to incorporate perspectives from both these experiences in the thesis.

During the work with this thesis, I leaned on my experience both as a big-city GP and a GP in a small rural community, and on knowledge obtained through communication with colleagues from more remote parts of Norway. In the international comparisons, I view the results through Norwegian glasses, but have received help and input from all the Nordic co-authors on article I. In my experience, there are striking similarities between the work of urban and rural GPs in Norway. It is similarly recognised from previous research that the major aspects of general practice are similar across different geographical and organisational settings, and distinctly different from specialised healthcare (45, 85).

11.2 Discussion of main results

11.2.1 Article I: The GP´s repertoire

Major aspects of primary healthcare, such as GP-patient continuity, empathy and patient-centeredness, are foundations of a strong primary healthcare and also play an essential role in the patient perceived quality (10, 50). The range of services (procedures and technical equipment) offered by GPs has received less attention in the research of the characteristics of primary care. However, in a study based on the QUALICOPC material, the authors found that in countries where GPs offer a broad range of services, the patients also experience better accessibility, continuity and comprehensiveness of care, and more involvement in decision making, i.e. better quality of care (15). Although difficult to quantify, it is possible that a GP who offers a wide range of services also has a high professional standard when it comes to other measures of healthcare quality.

Although much evidence support that countries with a strong primary care have better health outcomes (93, 94), there is no unequivocal evidence that a comprehensive and easily accessible primary healthcare reduces the use of more specialised medical services. Norwegian researchers found no reduction in the use of hospital outpatient clinics among elderly patients with frequent GP consultations (95). Overall health expenditures has been found to be higher in countries with strong primary care, but the growth in healthcare spending was slower compared to countries with less strong primary care systems (96). It should be of no surprise that better health services come at a greater cost.

The last years, there has been an increase in research regarding the Norwegian general practice services (97-101). Most studies focus on one specific procedure or a limited part of the services. Our study adds to the so far relatively meagre knowledge. A further broadening of this knowledge base, including more

comprehensive studies, will be valuable for substantiating the GPs´ future role in the healthcare system.

11.2.1.1 The GPs´ medical equipment

We found that GPs in the Nordic countries were well-equipped, but the Finnish GPs stand out with a much higher frequency of advanced technological equipment such as gastroscopes and radiological equipment (table 2 in the article). This is most likely a residual of the previous local hospitals that have been turned into large primary healthcare centres (102). The presence of this kind of equipment can be viewed as a sign of a strong primary healthcare sector and could thus be considered a role model for general practice in other countries. However, if this advanced equipment is not used frequently enough to ensure acceptable quality, it might be better to allocate the procedures to more specialised healthcare services. In health systems like the Norwegian and Danish, were most GPs are self-employed and the government decides the co-payment for patients, this kind of advanced equipment may not be cost-effective for the large majority of GPs. Nonetheless, an increasing number of Norwegian GPs now acquire ultrasound equipment as they find this to be a valuable diagnostic tool in general practice; in 2017, 1301 GPs got refunds from Helfo (The Norwegian Health Economics Administration) for performing ultrasound exams of the gall bladder and/or the abdominal aorta (103). There is insufficient data regarding the benefit of ultrasound examinations undertaken in general practice.

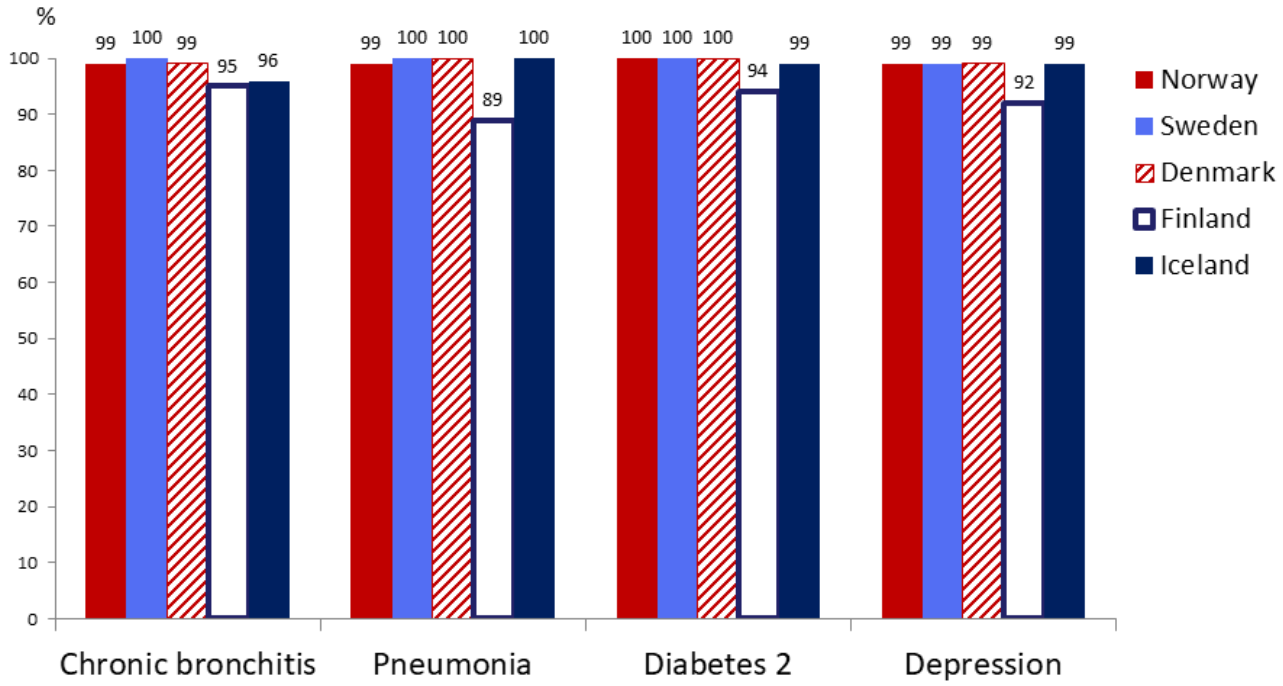
Our results support that the structural framework of a country's healthcare services influence the equipment available in the GP practices /primary healthcare centres. In Denmark, where patients can see an ophthalmologist without referral, only 1.4% of GPs have an eye tonometer, whereas 80.8 % of the Norwegian GPs have this equipment. Resuscitation equipment is less common in Norway and Denmark than in the other countries, possibly because of the high

cost of acquiring this equipment for the self-employed GPs (81). The same pattern was found for some of the laboratory equipment: In Finland (38%), Sweden (32%) and Iceland (24%) it is not uncommon for the GPs to have cholesterol meters in practice, whereas only 4% of the Danish GPs and 10% of the Norwegian GPs have this equipment. In Norway, there is no fee for service for doing point-of-care testing of cholesterol, meaning that the self-employed GPs must evaluate the economical sustainability of acquiring a cholesterol meter. However, when it comes to coagulometers (INR measurements to monitor the effect of anti-coagulant medication), the pattern is different: They are common in both Norway (67%), Sweden (62%), and Denmark (74%), less so in Finland (27%) and Iceland (4%). The differences probably partly reflects the effect of economic measures (Norwegian GPs receive a reimbursement for each INR measurement they do), and is partly due to different traditions in what a GP handles. In Iceland, it is more common that patients with heart disease do their routine check-ups with a cardiologist rather than a GP.

11.2.1.2 GPs´ involvement in treatment and follow-up

The GPs were asked about their involvement in treatment and follow-up of patients with common diagnoses (Table 6). When comparing the Nordic countries, there was no difference between the GPs´ involvement with regards to diagnoses such as COPD, type 2 diabetes, pneumonia or depression (Figure 8).

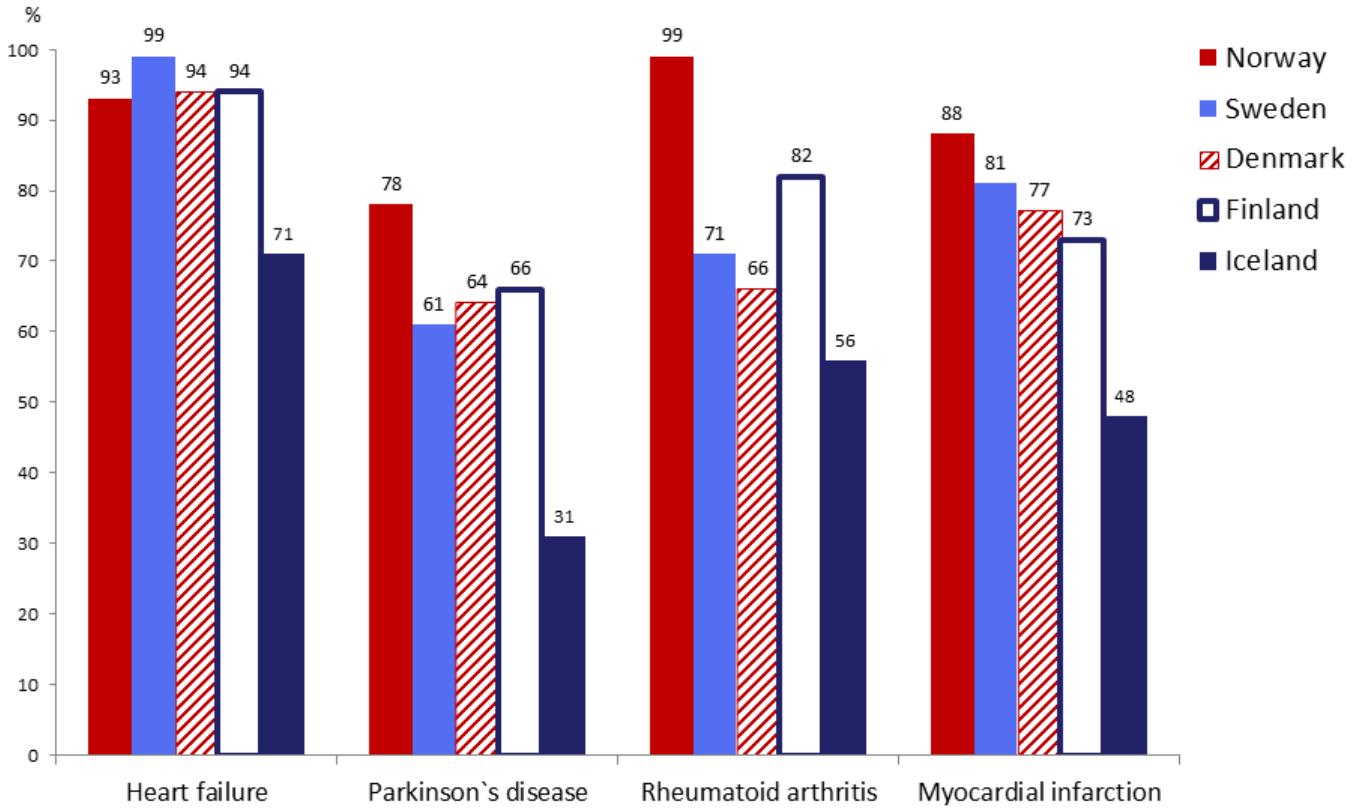
Figure 8. Percentage of Nordic GPs who are involved in treatment and follow-up of common diagnoses.



The Norwegian GPs were involved in the follow-up of a wide spectrum of diagnoses. This was as expected when considering the ideal of a comprehensive primary care, and is in line with the Coordination Reform that encourages the transfer of services from the hospitals to primary care (37). The gate-keeping system is probably also part of the explanation for why Norwegian GPs were more involved in the follow-up of patients with diagnoses like rheumatoid arthritis or Parkinson´s disease than for instance their Icelandic colleagues (Figure 9). However, the Norwegian GPs were also more involved in the follow-up of Parkinson´s disease than the Danish GPs, even if both countries have a gate-keeping system. This suggests that other factors, such as treatment traditions and the availability of medical specialists, also affect the GPs´ expected tasks. Moreover, it is likely that the Norwegian geography, often with long travel distances to hospitals for parts of the population, contributes to the difference between Norway and Denmark. In a study published in 1998 based on data from

30 European countries, including the Nordic countries, a significant difference between urban and rural GPs was found for 12 of the 30 countries regarding treatment and follow-up of diseases, with the tendency being that the rural GPs had a higher propensity than their urban peers to be involved in the follow-up of a selection of diseases (104). In our material, we found an association between distance to hospital and involvement in treatment/follow-up for three of the 12 listed conditions; Myocardial infarction, peritonsillar abscess and Parkinson´s disease. The GPs whose practises were close to hospitals were less involved in these conditions, probably reflecting a difference between rural and urban GPs. The first two of these conditions usually require acute specialised healthcare, and in central areas they will commonly be directed straight to hospital without being seen by a GP first.

Figure 9. Percentage of Nordic GPs who are involved in treatment and follow-up of "specialist diagnoses"



11.2.1.3 Medical procedures performed by GPs

We asked the GPs whether they performed a selection of common medical procedures in practice rather than referring the patients to a specialist (table 3 and 5 in article II). Not surprisingly, we found that several of the procedures were done less frequently by GPs whose practises were located close to a hospital. It is quite likely that when the travel distance to a specialist is long, both the GPs and the patients expect a wider selection of services to be provided in general practice. In a European study from 1998, there was a higher score for the provision of medical technical procedure among rural compared to urban GPs for 21 of 30 participating countries (104)

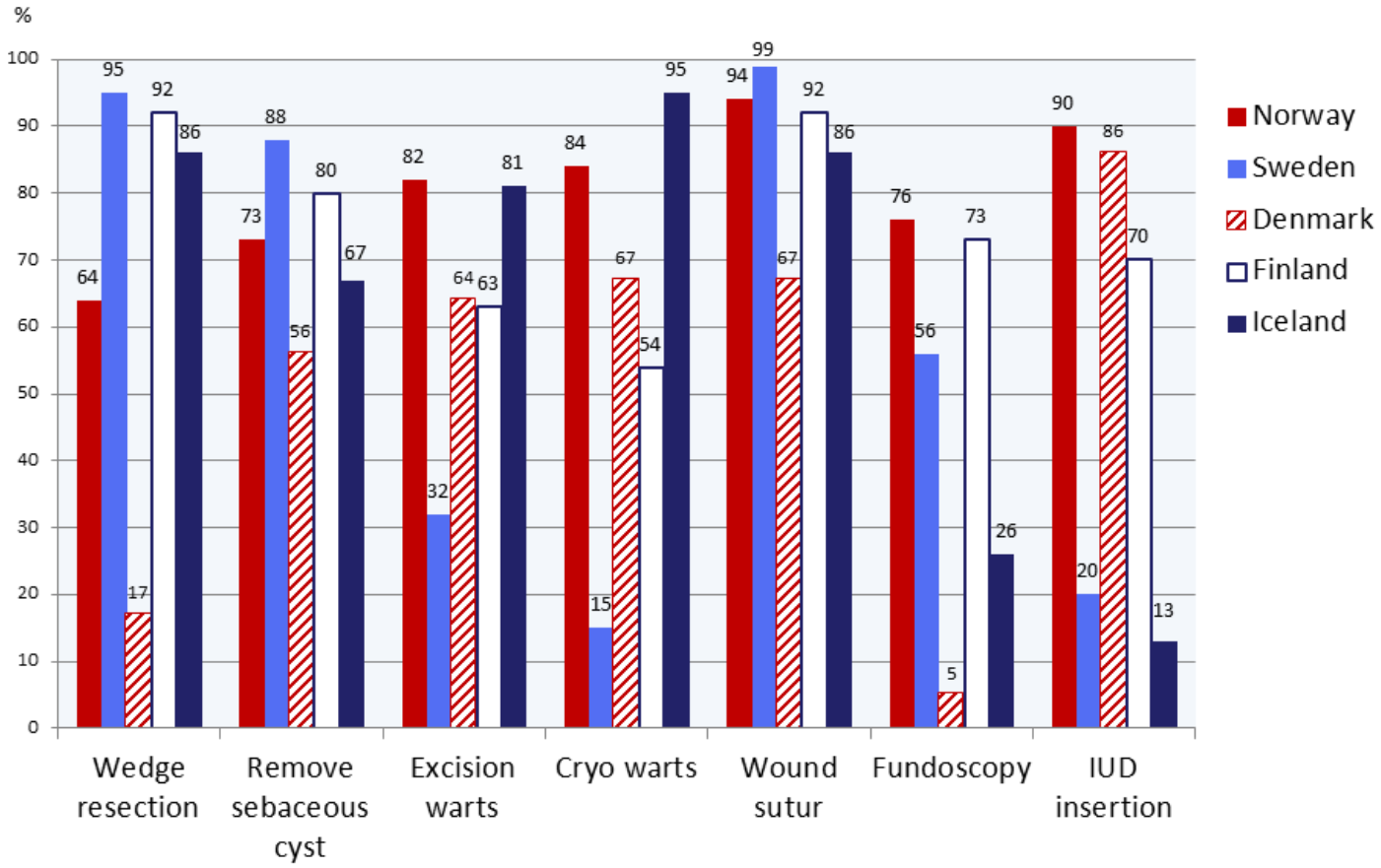
Both Swedish and Finnish GPs were more likely than their Norwegian colleagues to perform surgical procedures like removal of sebaceous cysts and wedge resection of toe nails (Figure 10). This finding was somewhat surprising, since the Norwegian referral system should encourage GPs to perform minor procedures themselves. The difference may be related to the fact that the Finnish and Swedish GPs are mainly employees in primary healthcare centres, where their income is not related to the number of patients they see per day. The Swedish and Finnish GPs also had patient consultations of longer duration than the Norwegians (table 1 in Article I). It may therefore be easier for them to prioritize more time consuming procedures, including minor surgical procedures. The Norwegian GPs were, however, more likely than their Swedish and Danish colleagues to report that they perform surgical excision of warts (some may have included excision of moles in their response). Provided that there is a wish for GPs to perform more surgical procedures, a change in the organisational framework to endorse longer lasting consultations may be beneficial. A reduction of the overall workload of the GPs, e.g. by reducing the size of the patient lists or lower the burden of administrative work tasks, may contribute to such a change. An increase in the reimbursement for medical

procedures may also serve as an incitement for Norwegian GPs to give priority to more time consuming procedures. In today´s setting where the Norwegian GPs report an increasing workload that many argue is rapidly approaching insurmountable (4, 105), a discussion is needed regarding whether it is recommendable or feasible for the GPs to increase their provision of surgical procedures. In this context, it is important to consider the increased workload that hospitals and private specialist will face if GPs refer more patients.

Norwegian GPs do more IUD-insertions than GPs in other Nordic countries, probably both due to structural differences with regard to task allocation, distance to specialists in rural areas, and also because the fee for service-system rewards IUD-insertions. A study from 2017 that focused on surgical procedures performed by Norwegian GPs (99) found a gender difference, where male GPs did more surgical procedures than female GPs, but less IUD-insertions, in concordance with our findings. The gender difference was, however, not confirmed in a recent Norwegian study, but in their material only 83% of the 151 included GPs inserted IUDs as opposed to 90% in our material. This study also described an association between the GPs´ gender and in which clinical situations gynaecological examinations were performed, where male GPs more often omitted the examinations (106).

Although the female GPs in our material more commonly inserted IUDs, male GPs in general performed more medical procedures than female GPs. We did not have data to further explore possible explanations for this discrepancy. Since an increasing proportion of doctors, including GPs, are women, this gender difference may potentially increase the future referral load from GPs to hospitals. Further studies on this topic are warranted.

Figure 10. Differences in medical procedures performed by Nordic GPs



11.2.2 Article II: The meeting between the GP and the patient

As outlined in chapter 7.4, studies on patient experience seem to give a better picture of the quality of primary care services than studies limited to patient satisfaction. In article II of this thesis we therefore focused on the patients´ communication experiences during their GP consultations.

A large majority of the patients in the Norwegian part of our study reported very positive experiences in the meeting with their GP. Ninety-eight per cent stated that the GP was polite, 97% that the GP listened carefully, and 91% that the GP spent sufficient time with them in the consultation. Only a few patients had experienced some difficulties in the communication; 7% reported that the GP

hardly looked at them while they talked, and 8% could not understand what the GP was trying to explain.

The patients´ age may be expected to influence how the patients perceive the communication with their GP. Patients in different age groups will not have similar reasons for seeing a GP. Furthermore, expectations towards the communication with the GP may differ between young and old patients, and the GPs may also have different attitudes towards different age groups. We found that the patients´ age was associated with several of the dependent communication variables listed in Table 7. Among the younger patients (<30 years), 94.5% reported that the GP asked questions about their health problem, as opposed to 87% in the oldest age group (> 65 years) (OR 2.3 [95% CI 1.1-4.6]). Most likely, the GPs will know their older patients better than the younger ones. They may therefore not have the same need to ask supplementary questions to many of the older patients. The older patients are also more likely to see the GP for a chronic disease that is already well known by the doctor. It was interesting to note that, compared with the middle age group (30-65 years), older patients were more likely to feel that they didn´t understand the GP´s explanation (10.8% versus 6.6%, OR 2.0 [1.1-3.4]), but they still more frequently felt that they could cope better after the GP visit (97.3% versus 86.9%, OR 4.7 [1.8-12.3]). Possible explanations for why older patients found it hard to understand the GP's explanation may be communication problems due to e.g. hearing problems, less familiarity with medical terms, or generally more complicated medical issues than those of the younger patients. A visit to the GP may still be a comfort for a person who worry about their health or about a chronic disease, and may thus lead to a feeling of increased coping after the visit, even if they did not understand the details of the medical explanations.

For the variable "After this visit, I can cope better with my health problems", we lacked information from 518 (33.9%) patients (401 patients that answered *I*

don´t know and 117 non-responders). There was no striking difference in the number of non-responders or patients who answered *I don´t know* among the different sub-groups of patients or GPs. The large amount of non-responders introduces some uncertainty when interpreting the results of this variable.

The size of the GPs patient list was associated with several aspects of the patients´ communication experiences. Compared with a medium sized list, both longer patient lists >1300 patients and shorter patient lists ≤900 patients were negatively associated with the patients´ perceived communication with the GP. Ideally, Norwegian patients are free to choose their GP, and may thus choose a GP with a shorter or longer patient list as they prefer. However, especially in less central municipalities, it is not uncommon that GP positions are either vacant, or there are not enough GP positions, to offer an actual free choice (107). The number of patients on the individual list is in theory up to the individual GP to decide, within the range of 500 to 2500 patients (30). However, if there is a shortage of GPs in a municipality, the GPs may feel an obligation to cover the needs for the local population, and experience a less realistic individual choice when it comes to list size. In small municipalities, the opposite situation may also be present: It is not possible to obtain the wanted number of patients on the list. In general, GPs in less central municipalities have shorter patient lists (108). In a recent Norwegian study it was found that GPs in small municipalities (≤ 10000 inhabitants) did more municipality work than GPs in municipalities with a larger population (109). This is probably part of the explanation for the rural GPs´ shorter patient lists.

When seeing a GP with a short patient list, the patients were less likely to report that the GP was polite, took sufficient time or asked questions about their health problem. When seeing a GP with a large patient list, the patients were more likely to report that the GP hardly looked at them while they talked, and they were less likely to feel that they could cope better with their health problem after the visit.

The effect sizes are however small, and the findings can hardly be used to make conclusions about an ideal patient list size. It does, however, seem like a medium sized patient list is better for the patients´ experience than either a small or a large list. GPs' patient lists are generally shorter in less centrally located municipalities (108), and the median duration of GPs´ contracts with the municipalities is longer in larger municipalities than in the smaller - and usually less central - ones (110). It is therefore possible that some of the associations found between a short patient list size and patient satisfaction may be confounded by less continuity of care in rural municipalities. The geographical location, defined as urban (big city, small town and suburbs) or rural (mixed urban/rural and rural), was included in the regression analyses as an independent variable, but this does not nullify potential confounding related to small patient lists. Moreover, the interpretation of the terms *urban* and *rural* are not unambiguous, and contributes to further uncertainty about the real reason for the observed association between list size and patent experiences. The study design does therefore not allow for definite conclusions to be drawn on this point.

The results do not convey information about the effect of list size on e.g. the comprehensiveness of practice or the quality of medical decisions made by the GP. It is possible that a list size out of the "ordinary" is a marker for GPs who also work a bit differently than the average GP. We do not have data on how many days per week the GPs work in their clinical practices. It is possible that GPs with small patient lists have additional employments elsewhere, and therefore have less time available per listed patient. In a recent Norwegian study on GPs´ prescriptions to elderly patients, it was found that GPs with lower practice activity, measured by list size and number of consultations per year, prescribed relatively more opioids and benzodiazepines by indirect patient contacts, thus disregarding the national guidelines stating that such prescriptions should only be done at face-to-face patient contacts (111). The study did, like ours, not report

the GPs´ number of days per week in practice. In further research on GPs´ professional activity, one should aim to record not only patient list size, but also how many days per week the GPs are in clinical practice, to obtain more information on possible reasons for the observed differences.

The study analyses cross-sectional data obtained from questionnaires, where patients were asked to indicate whether they agreed with different statements regarding the communication with the GP (Table 7). When interpreting the results, it is relevant to consider whether or not the participants convey their true opinions through the questionnaires. In a British study from 2017 it was found that patients who completed questionnaires regarding their own experiences seemed to overrate their GP´s consultation skills. Among patients that rated the GP´s interpersonal skills as "good" on a questionnaire following a consultation, only 42% gave positive statements regarding the same topic in a subsequent personal interview (112). Similar effects have been found in evaluation of other parts of the healthcare services (113, 114), including a study of Norwegian hospitalized patients (115). It is possible that patients´ overrating of the GPs´ communication skills may have masked existing associations with structural factors such as list size and geographical location.

11.2.3 Article III: Diverging expectations

In article III of this thesis, we aimed to study patients´ and GPs´ expectations regarding what a GP can be of help with, and to identify possible differences between the two. We have not been able to find other studies that directly compare GPs´ and patients´ attitudes in a similar manner to ours. To the best of our knowledge, this study therefore represents new insight.

11.2.3.1 Patients´ expectations

We found that male patients were less likely than females to believe that most people would see their GP for a selection of common conditions. This may reflect that women in general have a higher propensity than males to seek their GP (32, 116). The same was true for younger patients compared to the middle age group. This may be because younger persons have less concerns for serious illness and also less familiarity with their GP. It is also possible that younger persons have a lower threshold for seeking health-related information elsewhere, e.g. through social media. The older patients found it more important to see a GP in the presence of symptoms that may be related to serious illness, such as weight loss, headache and abdominal pain. This makes sense given the higher likelihood of serious disease with increasing age. In contrast to their lower propensity to seek a GP, the male patients still considered it more important than female patients to see a doctor when experiencing headache for more than one day. A tendency towards a similar gender difference regarding the estimated importance of seeing a doctor was observed for six of the seven listed symptoms, even if the results only reached the level of significance for headache. Women may be more used to everyday complaints such as abdominal pains and headaches, and may therefore not find it important to see a doctor for such minor complaints.

The only statistically significant association with geographical location was for the item deteriorated vision: the urban patients were less likely than the rural ones to say that most patients would see their GP. This can probably be contributed to better access to optometrists in urban areas. There were otherwise no significant geographical differences between urban and rural patients´ expectations to their GPs.

Although only 76 % of the patients agreed that people in general can be trusted, as many as 97% felt that doctors in general can be trusted, nicely illustrating the general satisfaction with the Norwegian GPs (31).

11.2.3.2 GPs´ expectations

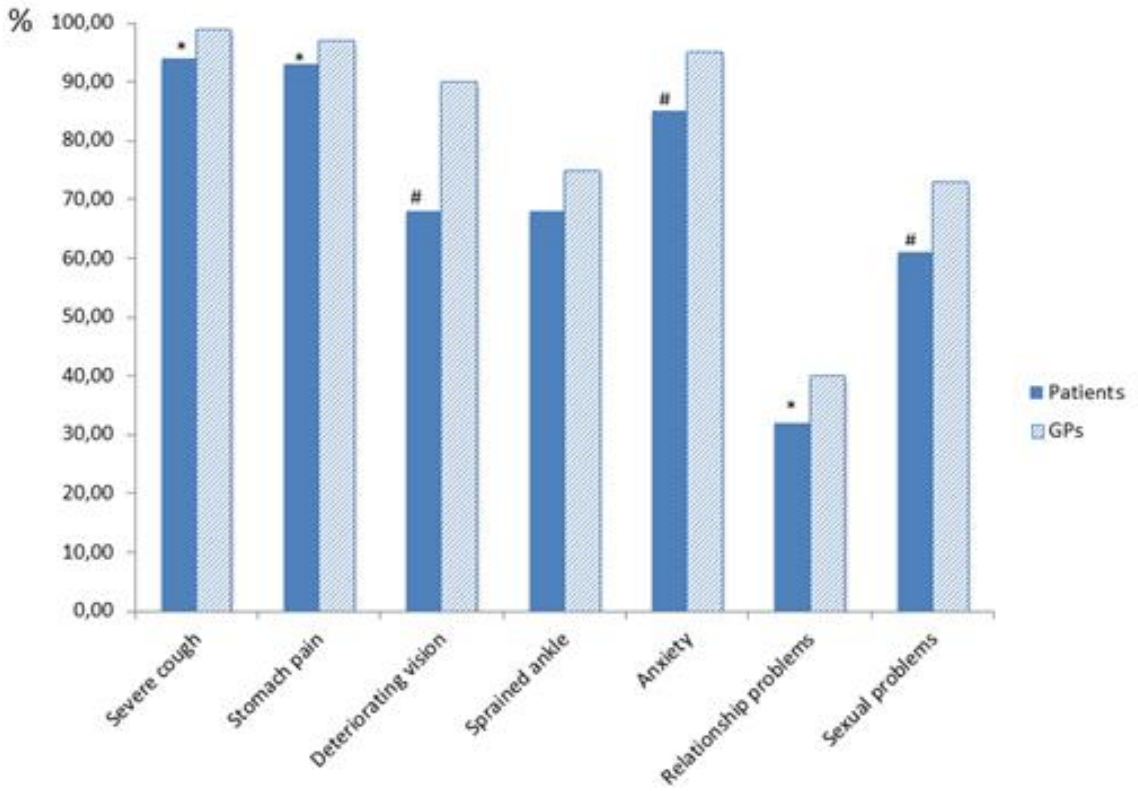
We found some interesting associations between the location of the GP practices and what the GPs expected their patients to see them for. The urban GPs were significantly less likely than their rural colleagues to believe that their patients would see them for an acute paresis (OR 0.2 [95% CI 0.1-0-.5]). There were also similar differences for sprained ankle (OR 0.3 [0.1-0.9]) and convulsions (OR 0.4 [0.2-0.8]). General practice in rural areas is usually an integrated part of the emergency services, whereas in bigger cities the responsibility for acute medical incidences is often allocated to separate emergency services. This probably accounts for the difference regarding paresis, sprained ankles and convulsions. The urban GPs were more likely than their rural colleagues to expect their patients to see them when in need for contraception (OR 4.5 [1.6- 12.3]), which is somewhat harder to explain. A possible explanation may be that young people in small communities avoid contacting the "family doctor" for contraception, due to anticipated stigma.

11.2.3.3 Comparison of patients´ and GPs´ expectations

The GPs´ expectations to what people will see them for did not match the patients´ expectations (Figure 11). The questions to the GPs and the patients were however not entirely identical, which posed some challenges when interpreting the results (Table 9). The GPs and the patients may have perceived the questions differently. The GPs were asked *whether their patients would contact them as the first doctor for a selection of health problems*, whereas the patients were asked *whether most patients would visit their GP for one of the*

conditions in question. It is possible that the GPs considered the behaviour of the patients that had already decided to seek help (i.e. the tip of the symptom iceberg, as described by Last and Hannay (61, 62)), whereas some patients may have interpreted the question as an evaluation of whether most people with the indicates symptoms would "move" from the submerged part of the iceberg to the tip of the iceberg. If this is the case, we may have overestimated the difference between GPs´ and patients´ expectations. However, for the non-somatic health issues there were between 16 and 31% of patients who did not respond to this question. This may reflect an uncertainty as to whether a GP can help them with these health problems, and the missing answers may have led to an underestimation of the differences.

Figure 11. Differences in GPs´ and patients´ expectations regarding healthcare seeking for common symptoms. # p<0.002 *p<0.05



Our study does not provide data on possible causes of the observed differences in expectations between GPs and patients. It is possible that the GPs have a perception of their own role as more all-encompassing than what is reflected in the population´s attitudes. Limited access to GPs due to long waiting time for appointments can make patients experience that GPs are less accessible than the GPs themselves tend to believe. It is also possible that negative publicity in mass media, implying that the GPs have poor availability and limited time, may lead people to believe that the GP cannot be of help for them. As outlined in the background section, Andersen and Newman´s behavioural model of health service use (53) describes different factors that influence patients´ decision making processes, illustrating the complex patterns that may be associated with our results.

In patient-centred healthcare services, the patients´ preferences are important, and in Norway there is an increasing focus on shared decision making (117). This concept is usually employed when discussing processes in the communication between an individual doctor and the patient. However, patients also have an important role in determining which kind of medical issues the GPs are required to handle, as the patients´ healthcare seeking behaviour will be a major influencer on which medical issues the GPs meet. Hence, the GPs´ activities may be viewed partly as a result of shared decision making between the GPs and their patients. When evaluating what GPs expect their patients to see them for, and what patients perceive as plausible reasons for seeking their GP, it is necessary to evaluate what kind of issues that *should* be a natural part of the GPs repertoire. As described in article I of this thesis, the medical procedures performed and diagnoses handled show significant variations among Nordic GPs. Patients´ expectations will be coloured by what they have previously experienced when seeing a GP, and these experiences will thereby affect what they are likely to see

a GP for at a later stage (55). About 40% of the GPs believed that their patients would see them for relationships problems. Some may argue that this signals a need for GPs to focus more on relationship problems since *only* 40% answered yes, but it may also be seen as a surprisingly high percentage given that relationship problems are not really a medical issue, nor is it highlighted in the medical education. The latter interpretation seems more reasonable, indicating that the GPs perceive their role as a likely "one-stop shop" for many daily life health-related issues (15). Only 32% of the patients answered that most people will see their GP about relationship problems, and it is possible that the GPs do not play a correspondingly universal role in the mind of the general population. It is also possible that patients tend to introduce this kind of topic during consultations as an additional issue rather than the primary topic for consultation. Thus, GPs may experience that patients commonly seek their advice for relationship problems, whereas the patients do not perceive this as their primary reason for consulting the GP.

11.2.3.4 Comparisons with previous research

Previous studies on patient expectations focus to a large degree on the process aspect of care (access, continuity, comprehensiveness, coordination) (45). In a study from 1999, Grol et al found that patients from different cultures had many views in common in particular with regards to accessibility and communication. However, their study did not look at neither expectations towards which health complaints they expected help with nor did they study the GPs´ expectations (52). A Danish study from 2002 found high correlation between GPs´ and patients´ evaluation of which aspects were deemed important within the fields of medical-technical care, doctor-patient relationship, information and support, availability and accessibility, and organisation of the services (118). They did not, however, look at expectations regarding which health complaints the patients expected a GP's help for. The same is true for a Swiss study from 2019 analysing

data from the QUALICOPC material regarding which aspects patients value as most important in general practice (119). Hence, we have not been able to find other studies that directly compare GPs´ and patients´ expectations towards which medical issues they expect the GP to help them with in a similar manner as ours. Previous studies have, however, confirmed that GPs are not always adept at assessing their patients´ preferences regarding pharmacological treatment (76, 77).

In a Norwegian study from 1997, the most prevalent reasons for encounter with the GP were musculoskeletal conditions, airway diseases, cardiovascular diseases, and psychological disorders (66). Data from Statistics Norway show that in 2017, the Norwegian GPs conducted 14.4 million patient consultations, of which 10.3% were coded with mental illness or mental health problems as the main reason for encounter (32) (Table 12). On this background, it is interesting to note that in our study, 94.8% of GPs expected their patients to see them for anxiety, while only 84.5% of patients believed that most people would see their GP for the same problem, and 65.8% of the patients expected to benefit from a visit to the GP if they felt nervous. A possible interpretation is that even though GPs see a lot of patients with mental health problems, there are still many people with such problems that do not seek their GP. We do not know whether the patients who replied that they do not expect to benefit from a visit to the GP when feeling nervous are those who have actually tried to seek their GP regarding this, or whether it is those who have no such experience. Further studies with a qualitative approach may reveal more about the nature of these interactions.

Table 12. Percentage of GP consultations in Norway by diagnosis groups, 2017. Source: Statistics Norway

Mental illness or mental health problems	10,3
Infections of the respiratory passages	9,3
Local pains and infections	8,3
High blood pressure	4
Functional intestinal problems	4
Back problems	3,7
Heart disease	3,7
Pregnancy, birth, contraception	3,7
Atopy, asthma, allergy or eczema	3,4
Accidents and injuries	3,3
Preventive contact	2,9
Diabetes	2,7
Joint and rheumatic problems	2,2
Administrative contact	2,1
Skin infections	1,9
Cancer	1,5
Gynaecological problems	1,5
General pains and muscle problems	1,4
Fear of illness	0,6
Other diagnoses	29,4
Total	100

Our study reveals that the GPs and their patients are not quite in concordance regarding their expectations to what prompts the patients to move from the submerged portion of the Symptom Iceberg to the surface part (Figure 4). If GPs and their patients have a mutual understanding of what the GP can assist with, this may contribute to a better and more rational use of health resources, for instance: 1. Avoid "unnecessary" appointments for issues that may be better cared for elsewhere. This will vary between different healthcare systems. In

Norway, an example would be a check of vision to see if you need glasses, which is better done at the optometrist. 2. Inform patients about the range of services provided by GPs. This may reduce the expectation for referrals. An example from the Norwegian setting is that many GPs have knowledge and education concerning cognitive behaviour therapy (120), while patients may expect that psychological problems implicates a need for referral to a psychologist. 3. Increased prevention of diseases may be obtained by a higher population awareness that the GPs can help with issues such as cessation of smoking. 4. Increase health literacy, even in a highly educated population such as the Norwegian one, to increase self-care with common conditions such as acute low back pain or self-limiting airway infections.

11.3 Future perspectives

11.3.1 The role of the Norwegian GP - now and in the future

The increasing workload for Norwegian GPs and an impending recruitment crisis in Norwegian general practice have received much public attention over the last years. The recruitment problems are most pronounced in smaller municipalities. In 2014, The Norwegian Centre for Rural Medicine (NCRM) mapped the state of the regular GP scheme in the 374 municipalities with less than 20 000 inhabitants(107). They found that 192 new GPs were needed to cover the demand for GPs in these municipalities in 2014, and that 62 of the patient lists (3.2%) had no affiliated GP. More than half of these patient lists were located in the three northernmost counties, and the lack of GPs was associated with decreasing centrality rather than the population size in the municipalities. In a report from 2018 regarding the GP services in Northern Norway, the NCRM found that the number of patient lists without an affiliated GP had increased from

32 in 2015 to 43 in 2017, and that vacant GP positions to an increasing extent are found also in the more centrally located municipalities (108).

In 2018, the Norwegian Directorate of Health published a report on Norwegian GPs´ working hours and how they use their time (3). The mean working time was 56 hours per week, 25% of the GPs worked more than 62 hours per week and 10% worked more than 75 hours per week (regulated full time employment in Norway is 37.5 hours per week). The working hours for the GPs were found to have increased by an average of seven hours per week since 2014, despite the fact that the average size of the patient lists had been slightly reduced during the same period. Hence, the working time per listed patient have increased.

The media attention towards the recruitment problems was partly initiated by a report in VG, Norway´s largest newspaper, in May 2017, conveying that 198 of a total of 425 municipalities in all parts of the country reported some degree of recruitment problems to vacant GP positions (121). The public attention was further sparked by the so called "GP riot", which was started in 2017 by a group of frustrated Norwegian GPs in Trøndelag county. They work to raise awareness of the increasing workload and decreasing recruitment of GPs among media and politicians. In 2018, the group launched a report that in detail described the everyday tasks of the GPs based on a web survey, albeit with a response rate of only 22% of the Norwegian GPs (4). On average, the GPs had 20 consultations per working day with a total of 43 unique problems/medical issues. According to their self-report, each GP on average read 15 hospital reports, renewed 26 prescriptions, assessed 150-200 results of blood tests, wrote 3.2 referrals to specialists, admitted 0.5 patients to hospitals and performed one gynaecological exam per working day. 59% of the responding GPs had considered quitting their job during the past six months because of the work pressure, and only 32 % agreed that they will most likely still work as a GP in five years if the organisational and economic framework remains unchanged.

The GPs´ situation and the increasing recruitment problems have the last couple of years been given increased attention both by journalists, politicians and the GPs themselves (Figure 12). The debate is still ongoing, with discussions regarding possible effects of changing the economic framework, whether more GPs should be on fixed salaries rather than self-employed, whether a decrease in patient list size is feasible without an unrealistic increase in the number of GPs, whether other professional groups (e.g. nurses, midwifes) may alleviate the burden for the GPs, and whether team-work in so-called primary healthcare teams (122) will mean more or less work for the GPs.

Figure 12. A selection of headlines on the situation of Norwegian GPs in the newspapers VG and Aftenposten 2017 – 2018

In a recent master´s degree thesis from the University of Oslo, the authors found large variations in different municipalities´ organisation of primary healthcare. They concluded that the municipalities´ organisation of primary care has a significant effect on the GPs´ everyday work and the degree of recruitment problems. There was, however, no uniform agreement among the participating GPs concerning which measures that would better secure the role of Norwegian general practice in the future (123). In 2017, NMA launched a report on leadership of the municipal healthcare services (124). The report argues that a better defined leadership will contribute to more coordinated health services and better prioritising of resources, leading to more cost-effective and equitable healthcare services for the patients. It specifies the need for better leadership of the GP practices, but does not go into detail concerning how this could be implemented. Better defined leadership may entail an evaluation of which tasks that should *not* be considered a part of the GPs´ responsibility as well as a discussion about how structural frameworks can promote and preserve the existing strong role of the Norwegian GPs. This discussion is a political as much as a scientific or medical question, and is beyond the scope of this thesis.

In light of the high workload, it is interesting that the GPs have higher expectations than their patients as to what the patients will see them for. More research is needed in a Norwegian context to explore both how patients conceive the services provided and what is most important for them when seeking healthcare (125). A qualitative approach may provide further understanding of the experiences and expectations of GPs and their patients. The recently established Norwegian research network for general practice (126) will hopefully provide opportunities to explore differences in quality, services, and GP and patient expectations in different organisational structures both on a national level and also through international comparative studies in cooperation with research networks in other countries.

11.3.2 General practice as a one-stop shop – a sustainable ideal?

One-stop shop (definition):
Self-contained office or outlet that provides (almost) everything needed to satisfy a customer order or request, complete a process, or fulfill a requirement.

(Businessdictionary.com)

In this thesis, I have shown that GPs in the Nordic countries provide a broad spectrum of medical services, and that Norwegian GPs expect their patients to see them for both somatic, psychological and preventive issues. Comprehensiveness and continuity of care are well established as key features of general practice. A recent study showed that in countries where general practice serves as a "one-stop shop", providing a wide spectrum of services, patients also perceive better quality of care (15). In the United States, where primary care has a less central role in the healthcare services compared with the Nordic countries, the population that receive primary care still reported more high-value care and better healthcare experiences (127). To ensure the continuous role of the GP as the hub in the patients´ health services in Norway, it is important to secure a framework that enables such a role.

In a study by Hobbs et al. in 2016, the authors examined 100 million consultations in primary care in English general practice in the period 2007 to 2014 (128). They found an *increase* in consultation rates, an *increase* in mean consultation time, and an *increase* in the parts of the population with the highest consultation rates. In contrast, they found a *decrease* in the number of full-time equivalent GPs per 100 000 inhabitants. They estimated an overall workload increase by 16% for the GPs in the course of these seven years, and concluded that the English primary healthcare system seems to have reached a saturation point. The Nordic health systems are not that different from the British, and, as described above, the increasing workload of the Norwegian GPs has received

much public attention. In a recent Norwegian qualitative study among 23 GPs and 10 co-workers, a heavy and increasing workload was described (105). No uniform explanation for this was given by the GPs, but they all reported increased workload per patient. Some of the GPs also discussed whether the perception of increased workload may be partly ascribed to changing mentality and expectations. The late Tage Erlander, Swedish Prime Minister from 1946-1969, relaunched the concept of "the discontent of rising expectations", an idea originally introduced by French historian Alexis de Tocqueville (1805-1859), describing how revolutions happen when living standards, and thereby expectations, increase (129). Awareness of the increased expectations regarding the services provided by GPs and the (un-)feasibility of providing these services within the existing framework may be conducive to understanding some of the recruitment problems seen both in Norway and other parts of Europe today.

It seems that Norwegian GPs, similarly to their British colleagues, are quickly approaching an upper limit for their capacity. We found that Norwegian GPs perform a wide variety of procedures and are widely involved in the treatment of many different diseases and medical issues. When comparing data from the European Task Profile Study from 1993 (83) with the QUALICOPC data from 2013, a relative increase in the GPs´ participation in disease management was found in all the Nordic countries (13). For performance of minor technical procedures, Iceland, Denmark and Finland showed a relative decrease in the same period, whereas there was an increase in Sweden and Norway. Norwegian researchers found the same tendency when looking at surgical procedures performed by Norwegian GPs from 2006 to 2013 (99). There was an increased performance of both minor and major surgical procedures in general practice.

Patients with previous good experiences in general practice are more likely to seek care, especially for minor complaints (19). Knowing that the Norwegian GPs are highly valued by the population (31), and that the health authorities aim to

transfer tasks from specialist healthcare to primary care (2), it is probable that there will be a further increase in the demand for the GPs´ services. Not only primary care, but also specialized healthcare services, experience an increasing workload, and the transfer of tasks ("oppgaveoverføring") to GPs from e.g. cancer care (97) contributes to the workload among the GPs. When planning changes in the organisation of either primary care or specialised services, it is essential to involve both parties in the process to avoid unwanted consequences.

The organisational framework, both economical and otherwise, may need to change in order to accommodate the GPs´ role as the one-stop-shop of the healthcare services. An alternative solution would be to narrow the scope of expected tasks for the GPs, but this may undermine the GPs´ strength as the supplier of continuity and as cornerstone in the otherwise fragmented specialized healthcare services. In non-central parts of a country like Norway, it is necessary for the GP to be able to provide a wide spectre of medical services for their patient population due to long travel distances and some places lack of personnel in specialized healthcare. Even in more central parts of the country the GP holds an important coordinating role. In Norway´s capital and only big city, Oslo, the secondary healthcare has a very complex organisation, rendering the GPs´ role as a supplier of continuity essential (130). There is a need for research with prospective methods to investigate consequences for general practice when the framework changes within all levels of the healthcare services.

12 CONCLUDING REMARKS

Norwegian GPs provide a wide array of medical services, almost all patients are very content with how they are met by the GP, and both the GPs and the patients expect people to see their GPs for most somatic and psychosocial complaints. With this in mind, Norwegian general practice seems to be a good arena for the ideal of continuous, comprehensive, personal and committed healthcare services. However, an expectation to be able to do "everything", if the organisational framework is not appropriate, may entail a risk of work overload, decreasing work satisfaction and thereby recruitment problems in general practice. Strong primary care systems that provide both comprehensive and continuous services, where the GP provide a "one-stop shop" for a majority of their patients´ health issues, ensure both better cost effectiveness and high patient-perceived quality (15, 22). We have shown that the Norwegians GPs provide, and expect to provide, comprehensive services in line with these ideals.

The preservation of the GPs´ invaluable role as provider of personal, continuous and comprehensive healthcare requires a conscious, knowledge-based approach when changes in the organisational framework of both primary and secondary healthcare services are considered. In the ongoing discussions regarding the best ways to organise primary healthcare systems, one should however keep in mind that one size does not necessarily fit all in general practice, neither for the GPs nor their patients.

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14 ERRATA

Page	Correction type	Correction
Page 3	Formatting	Page numbers in Table of contents are changed due to corrections below
Page 20 (Previous p 19)	Text	«Error! Not a valid book-mark self-reference» is replaced with «Figure 1»
Page 28 (Previous p 27)	Formatting	Text "Figure 3" is moved to the line above. Line spacing changed to conform with the rest of the thesis.
Page 31 (Previous p 30)	Text	"…contacted their the GP" changed to "…contacted their GP"
Page 31	Formatting	Second paragraph changed to the Cambria font
Page 34	Formatting	Changed page layout so that Table 1 fits into one page
Page 84	Formatting	Text "Figure 11" is moved to the line above

15 APPENDICES

Appendix A Invitation to GPs

UNIVERSITETET I OSLO

Avdeling for allmennmedisin
Institutt for helse og samfunn, UiO
Postboks 1130, Blindern
N-0318 Oslo
Jørund Straand, professor dr.med.
Avdelingsleder

Telefon: +47 22 85 06 47
Telefaks: +47 22 85 06 50
e-post: jorund.straand@medisin.uio.no

Til interesserte fastleger
Oslo, januar 2013

Vil du hjelpe oss med å bygge ny kunnskap om primærhelsetjenesten i Norge og Europa?

QUALICOPC (QUALIty and COsts of Primary Care in Europe) er en EU-finansiert studie som skal samle inn data i 34 land fra totalt 7500 allmennleger og 75 000 pasienter. Målet er å kartlegge hvilke tjenester allmennlegene utfører i de ulike landene, samt å vurdere pasienters forventninger til og tilfredshet med allmennlegenes tjenestetilbud.
De fire allmennmedisinske forskningsenhetene i Norge har gått sammen om å gjennomføre den norske delen av studien. Resultatene vil bli formidlet nasjonalt og internasjonalt sammenstilt med tilsvarende data fra andre land.
Til sammen skal vi i Norge rekruttere 220 norske allmennleger, hvorav 70 fra oss her ved UiO. Vi håper å få dette til med god hjelp fra dere!

Hva innebærer det å delta?

- utfylling av ett spørreskjema (tar ca 15-20 minutter)
- tillatelse til at vi kan spørre 10 av dine pasienter om å fylle ut et kort pasient-spørreskjema

Når det gjelder pasientskjemaene, er det lurt å involvere legesekretærene. De kan da distribuere skjemaet til 10 av dine pasienter over 18 år en tilfeldig valgt dag, og samle det inn etterpå (noen av spørsmålene må besvares etter endt konsultasjon). Alternativet er å bruke student i praksis til dette arbeidet for de som er praksislærere. Det vil være mulig å rekruttere flere leger fra samme praksis.

Som takk for hjelpen vil hver deltagende lege motta et gavekort på kr 400. Dersom medarbeider tar jobben med utdeling/innsamling av pasientskjemaene vil dere i tillegg få et gavekort på kr 500. Dette betyr at for hver lege som deltar med 10 pasienter vil kontoret kunne motta til sammen kr 900. Dersom flere leger ved kontoret deltar, vil dette bli en fin sum å bruke til sosiale tiltak ved legekontoret!

Både lege- og pasientskjema er anonyme. Fordi vi skal sammenstille svar på lege-skjemaet med svar fra pasienter hos samme lege, må vi ha en koblingsnøkkel i innsamlingsfasen. Når svarene legges inn på data, vil de imidlertid være fullstendig anonymisert slik at det ikke er mulig å identifisere verken lege eller legepraksiser. Det er dessverre derfor heller ikke mulig å få konkret tilbakemelding om hva dine pasienter svarte. Undersøkelsen er lagt fram for regional etisk komité som vurderer dette å være et kvalitetsprosjekt.

Vi håper du kan tenke deg å være med på dette! Ta i så fall kontakt på mail t.b.eide@medisin.uio.no

Vennlig hilsen

Torunn Bjerve Eide
Allmennlege og forsker

Jørund Straand
Avdelingsleder og professor,
Allmennmedisinsk Forskningsenhet ved Avdeling for allmennmedisin

Appendix B Information poster for the GPs´ waiting rooms

Kan du avse 15 minutter til å hjelpe oss å skaffe mer kunnskap om kvaliteten i norsk allmennpraksis?

Vårt legekontoret deltar, gjennom Universitet i Oslo, i et europeisk forskningsprosjekt som tar for seg kvalitet i primærhelsetjenesten. I dag vil en av våre medarbeidere be deg om din deltagelse i prosjektet.

Hvis du takker ja vil du få et spørreskjema som skal fylles ut dels før og dels etter at du har vært inne hos legen. Du vil få nærmere informasjon om dette, og hjelp ved utfylling hvis behov. Ferdig utfylt skjema leveres til medarbeideren. Du skal ikke oppgi personalia på skjemaet, og opplysningene du gir kan ikke tilbakeføres til deg.

Vi håper du kan sette av tid til å delta i denne undersøkelsen!

Appendix C Information sheet to patients

UiO : Det medisinske fakultet
Universitetet i Oslo

Til pasienter ved legesenteret

Forespørsel om å delta i en europeisk studie av kvalitet i allmennpraksis

Studien skal vise hvilke tjenester som utføres ved norske allmennlegekontor, samt pasienters forventing til og tilfredshet med allmennlegenes tjenestetilbud. Det er viktig å undersøke styrker og utfordringer i norsk primærhelsetjeneste for å kunne fordele ressurser på en mest mulig fornuftig måte. Universitetene i Oslo, Bergen, Trondheim og Tromsø deltar i denne studien som omfatter 34 land.

Undersøkelsen baserer seg på spørreskjemaer utfylt av 220 fastleger i Norge og 2200 av deres pasienter. Besvarelsene er anonyme og ingen svar kan spores tilbake til deg som person. Av den grunn er prosjektet ikke fremleggingspliktig for regional etisk komité for medisinsk og helsefaglig forskning.

Hva innebærer det å delta:

En av våre prosjektmedarbeidere gir deg et spørreskjema som det tar ca 15 minutter å fylle ut. Noen spørsmål må fylles ut etter at du har vært inne hos legen. Prosjektmedarbeideren gir deg nærmere informasjon om dette og kan hjelpe deg under utfyllingen, hvis du ønsker det.

Du skal ikke oppgi navn eller fødselsdato på spørreskjemaet, og ingen ved legekontoret (heller ikke legen du har vært hos) får se innholdet i skjemaet du har besvart.

Vi håper du kan sette av tid til å delta i undersøkelsen!

Vennlig hilsen

Torunn Bjerve Eide
Allmennlege og forsker
e-post: t.b.eide@medisin.uio.no

Jørund Straand
Professor Avdeling for allmennmedisin
e-post: jorund.straand@medisin.uio.no

Institutt for helse og samfunn
Postadr.: Postboks 1130 Blindern, 0318 Oslo
Besøksadr.: Stjerneblokka, Nedre Ullevål 9, 0850 Oslo
Telefon: 22 85 05 50
Telefaks: 22 85 05 90
postmottak@medisin.uio.no
www.med.uio.no/helsam
Org.nr.: 971 035 854

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RESEARCH ARTICLE

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Differences in medical services in Nordic general practice: a comparative survey from the QUALICOPC study

Torunn Bjerve Eide[a], Jørund Straand[a], Cecilia Björkelund[b], Elise Kosunen[c,d], Ofeigur Thorgeirsson[e], Peter Vedsted[f] and Elin Olaug Rosvold[a]

[a]Department of General Practice, Institute of Health and Society, University of Oslo, Oslo, Norway; [b]Department of Primary Health Care, Institute of Medicine, University of Gothenburg, Gothenburg, Sweden; [c]School of Medicine, University of Tampere, Tampere, Finland; [d]Centre of General Practice, Pirkanmaa Hospital District, Pirkanmaa, Finland; [e]Grafarvogur Primary Care Centre, Reykjavik, Iceland; [f]Research Unit for General Practice, Aarhus University, Aarhus, Denmark

ABSTRACT

Objective: We aim to describe medical services provided by Nordic general practitioners (GPs), and to explore possible differences between the countries.

Design and setting: We did a comparative analysis of selected data from the Nordic part of the study Quality and Costs of Primary Care in Europe (QUALICOPC).

Subjects: A total of 875 Nordic GPs (198 Norwegian, 80 Icelandic, 97 Swedish, 212 Danish and 288 Finnish) answered identical questionnaires regarding their practices.

Main outcome measures: The GPs indicated which equipment they used in practice, which procedures that were carried out, and to what extent they were involved in treatment/follow-up of a selection of diagnoses.

Results: The Danish GPs performed minor surgical procedures significantly less frequent than GPs in all other countries, although they inserted IUDs significantly more often than GPs in Iceland, Sweden and Finland. Finnish GPs performed a majority of the medical procedures more frequently than GPs in the other countries. The GPs in Iceland reported involvement in a more narrow selection of conditions than the GPs in the other countries. The Finnish GPs had more advanced technical equipment than GPs in all other Nordic countries.

Conclusions: GPs in all Nordic countries are well equipped and offer a wide range of medical services, yet with a substantial variation between countries. There was no clear pattern of GPs in one country doing consistently more procedures, having consistently more equipment and treating a larger diversity of medical conditions than GPs in the other countries. However, structural factors seemed to affect the services offered.

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General practice; Organisation and Administration; health services; Nordic countries; diagnosis; equipment; procedures; QUALICOPC

Background

General practitioners (GPs) are usually considered key service providers in primary care [1]. There is varying organisation of general practice both within and between countries, and the organisational framework is of significance to the services offered [2–4]. Available appropriate medical equipment is positively correlated with the quality of medical performance [5], and GPs with good access to basic diagnostic tests both diagnose, treat and refer patients more appropriately [6].

In 1993, the European Task Profile Study investigated service provision for GPs in 30 European countries [2]. Finland and Iceland scored higher than the Scandinavian countries when it came to application of medical techniques and procedures. With regard to comprehensive disease management in Nordic general practice, Norway scored the highest and Finland the lowest. Norwegian GPs' available equipment was described in an extensive report from 1981 [7], but both the organisation of the primary health care system and the available diagnostic and therapeutic equipment has changed significantly since then. A study from 2001 explored differences in consultation rates and diagnoses given by Nordic GPs [8]. Some more recent studies from other European countries describe the spectrum of medical equipment in the respective countries [9,10]. It remains unknown how this compares with the situation in the Nordic countries. Updated and systematic knowledge about available technical equipment, tests, medical procedures

CONTACT Torunn Bjerve Eide t.b.eide@medisin.uio.no Department of General Medicine, Institute of Health and Society, University of Oslo, PB 1130, Blindern, 0318 Oslo, Norway

and conditions primarily handled in Nordic general practices is needed.

Health systems in the Nordic countries

The Nordic countries (Norway, Denmark, Finland, Sweden and Iceland) have comparable political structures, and health care systems are based on the Nordic welfare model, aiming for equal access to health care services for all residents. However, when it comes to primary care and general practice, there are important organisational differences (Box 1).

Aim

The aim of this study is to describe services provided by Nordic GPs in terms of available diagnostic and therapeutic equipment, tests and procedures in the GPs' offices. We also aim to describe differences between Nordic GPs' clinical involvement in treatment and follow-up for a selection of diagnoses.

Material and methods

Our material originates from the study Quality and Costs of Primary Care in Europe (QUALICOPC) [11]. A set of four questionnaires was developed by the QUALICOPC Partner Consortium, led by the Netherlands Institute for Health Services Research (NIVEL). The construction of the questionnaires, as well as a detailed account of their contents, is extensively described elsewhere [12], as are the details concerning the implementation of the QUALICOPC study [11]. The development of the questionnaires was based on existing, validated questionnaires. Participating GPs completed a questionnaire reporting information about their individual practices.

Sample

In Sweden and Denmark, random national samples of GPs were invited to participate. In Iceland, the entire GP population was invited. In Finland, there was a mixed procedure of random sampling plus selected GPs. In Norway, there was convenience sampling within formal and informal GP networks. Based on calculations in previous research [11], the study aimed to realize a response of 220 GPs from each participating country except Iceland (aim 75 GPs). Inclusion stopped when a satisfying number of responders was reached, or when no further recruitment was considered feasible. In Denmark and Norway, the GPs received an economic incentive for participation, and in Iceland participants were invited to a seminar [13]. In Sweden and Finland, no incentives for participation were offered. All questionnaires were answered anonymously. Data collection took place from 2011 to 2013.

Measures

We recorded the following demographic variables: GP's gender and age, solo or partnership practice,

Box 1. Organisation of general practice in the Nordic countries

	GP employment	Patient affiliation	Patient co-payment	Gate-keeping
Norway 5.2 mill inhab GDP €49 200 (2013)[a]	Mostly self-employed. Receive a combination of capitation fee and fee-for-service	Individual patient list system. All inhabitants are assigned to or choose a regular GP	Co-payment for adults ≥16 years	For all specialities
Sweden 9.8 mill inhab GDP €32 700 (2013)[a]	Mostly employees in public (60%) or private health centres	All patients can register with a primary care centre (some centres offer registering with a specific GP)	Co-payment for adults ≥20 years	No
Denmark 5.6 mill inhab GDP €32 100 (2013)[a]	Mostly self-employed. Receive a combination of capitation fee and fee-for-service	Patients listed with a general practice. 1% are not listed (group 2-insured)	No co-payment (group 2-insured pay part of the fee and have free choice of GP)	For most specialities. Patients can contact ophthalmologists and ear-nose-throat specialists directly
Finland 5.4 mill inhab GDP €37 559 (2014)[a]	Mostly employees in public/private health centres or in occupational health care	Patient affiliation with public health centres or occupational health care centres. Partly subsidised private services also available	Co-payment for adults ≥18 years in public health centres, variations between municipalities. No co-payment in occupational health care	Referral is needed for specialist consultations through the public health system. Self-paying patients can contact all private specialists directly
Iceland 329100 inhab. GDP €30 000 (2013)[a]	Mostly employees in public health centres	Patient affiliation with health centres	Co-payment for adults ≥18 years. Reduced co-payment >67 years	No

[a]Information from the Nordic co-operation www.norden.org/en/fakta-om-norden-1/the-nordic-countries-the-faroe-islands-greenland-and-aaland (January 2017).

whether the GPs were self-employed or employees, and size of patient list. The GPs estimated how many face-to-face patient contacts they had on a normal working day, usual length of a consultation in their office and the distance to the nearest hospital.

The GPs indicated from predefined lists which equipment was in use by themselves or their staff, which procedures that were carried out by themselves or their staff as opposed to referring to secondary care specialists, and to what extent they were involved in the treatment and follow-up of patients with a listed selection of diagnoses. The eligible selection of equipment, procedures and diagnoses is indicated in Tables 2, 3 and 4, respectively. All questions focused on regular practice and not the situation in out-of-hours care.

The GPs were given four possible answers concerning to what extent they performed the indicated procedures, and to what extent they were involved in treatment and follow-up of the given diagnosis: 1. (Almost) always; 2. Usually; 3. Occasionally; and 4. Seldom/never. These were merged into two categories during analysis: always/usually (1 + 2) and occasionally/never (3 + 4).

Statistics

We present descriptive statistics with numbers, percent, min–max intervals and 95% confidence intervals (95%CI). To identify differences between countries, we used binary logistic regression adjusting for GPs' sex

Table 1. Demographics of participating GPs in the Nordic part of the QUALICOPC study.

	Norway	Denmark	Sweden	Finland	Iceland
Total *N*	198	212	97	288	80
Female (%)	39	43	55	71	28
Age mean (range)	45.7 (28–69)	53.1 (35–76)	52 (34–69)	45 (25–70)	54.5 (33–68)
Practices with distance to hospital >20 km (%)	28	20	33	32	12
Share practice with other GPs (%)	99	72	99	65	98
Self-employed (%)	93	99	14	5	9
Number of consultations per day[a] Mean (range)	19 (2–30)	23.8 (12–40)	13 (7–25)	12.7 (2–40)	13.2 (7–25)
Duration of regular consultation in minutes.[a] Mean (range)	18.6 (10–30)	14.3 (7–20)	24.1 (15–30)	23.9 (10–60)	19.3 (10–30)

[a]Estimated by the GPs.

Table 2. Medical equipment in GP practices in the Nordic countries[a].

	Norway, *N* = 198 GPs		Sweden, *N* = 97 GPs		Denmark, *N* = 212 GPs		Finland, *N* = 288 GPs		Iceland, *N* = 80 GPs	
Equipment	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
Hemoglobinometer	195	98.5	95	97.9	201	94.8	235	82.7	68	85.0
Blood glucose test	197	99.5	93	95.9	205	96.7	274	96.5	75	93.8
Cholesterol meter	19	9.6	31	32.0	8	3.8	108	38.0	19	23.8
Blood cell counter	81	40.9	33	34.0	36	17.0	106	37.3	19	23.8
Ophthalmoscope	197	99.5	79	81.4	131	61.8	275	96.8	61	76.3
Proctoscope	153	77.3	97	100.0	76	35.8	261	91.9	42	52.5
Otoscope	198	100.0	96	99.0	210	99.1	277	97.5	74	92.5
Gastroscope	2	1.0	0	0.0	1	0.5	83	29.2	1	1.3
Sigmoidoscope	7	3.5	5	5.2	0	0.0	83	29.2	11	13.8
X-ray	11	5.6	3	3.1	0	0.0	178	62.7	8	10.0
Ultrasound	33	16.7	4	4.1	24	11.3	164	57.7	10	12.5
Microscope	125	63.1	61	62.9	153	72.2	64	22.5	58	72.5
Audiometer	89	44.9	71	73.2	118	55.7	234	82.4	73	91.3
Bicycle ergometer	4	2.0	7	7.2	1	0.5	88	31.0	6	7.5
Eye tonometer	160	80.8	36	37.1	3	1.4	259	91.2	36	45.0
Peak flow meter	161	81.3	94	96.9	204	96.2	280	98.6	67	83.8
Spirometer	197	99.5	95	97.9	206	97.2	188	66.2	79	98.8
Electrocardiograph	196	99	97	100.0	175	82.5	270	95.1	80	100.0
Blood pressure monitor	197	99.5	96	99.0	209	98.6	283	99.6	80	100.0
Infusion set	116	58.6	64	66.0	86	40.6	253	89.1	71	88.8
Doctor's bag	167	84.3	94	96.9	208	98.1	180	63.4	78	97.5
Urine catheter	179	90.4	91	93.8	186	87.7	266	93.7	61	76.3
Coagulometer	134	67.7	60	61.9	157	74.1	76	26.8	3	3.8
Set for minor surgery	194	98.0	95	97.9	206	97.2	269	94.7	72	90.0
Suture set	195	98.5	96	99.0	210	99.1	278	97.9	77	96.3
Defibrillator	129	65.2	94	96.9	79	37.3	269	95.7	77	96.3
Disposable syringes	195	98.5	94	96.9	210	99.1	279	98.2	80	100.0
Disposable gloves	198	100.0	96	99.0	211	99.5	280	98.6	80	100.0
Refrigerator for medicines	198	100.0	96	99.0	212	100.0	279	98.2	79	98.8
Resuscitation equipment	166	83.8	84	86.6	193	91.0	270	95.1	76	95.0

[a]Question: please tick the equipment used in your practice by yourself or your staff.

Table 3. Number and valid percentages (95% CI) of GPs who reported that they usually or always performed the listed procedures, or were involved in treatment/follow-up of the listed diagnoses.

	Norway, $N = 198$			Sweden, $N = 97$			Denmark, $N = 212$			Finland, $N = 288$			Iceland, $N = 80$		
	n	%	95% CI	*n*	%	95% CI	*n*	%	95% CI	*n*	%	95% CI	*n*	%	95% CI
Procedures[a]															
Wedge resection	127	64.1	57–71	91	94.8	91–99	36	17.2	12–22	257	91.5	89–95	69	86.3	78–94
Wound suturing	186	94.4	91–97	95	99.0	97–100	141	66.8	61–73	258	91.8	89–95	60	75.0	78–94
Removal sebaceous cyst	144	73.1	67–79	84	87.5	81–95	118	55.9	49–63	226	80.4	75–85	52	66.7	57–77
Excision wart	163	82.3	77–87	30	31.9	23–41	135	64.0	58–70	175	62.9	57–69	64	81.0	72–90
Insertion IUD	177	89.8	86–94	19	19.8	12–28	182	86.3	81–91	195	69.6	65–75	10	12.5	6–20
Fundoscopy	151	76.3	70–82	53	55.8	46–66	10	4.7	2–8	206	73.3	68–78	21	26.3	16–36
Joint injection	109	55.1	48–62	87	90.6	85–97	106	50.2	43–57	267	95.7	94–98	61	7.2	68–86
Strapping ankle	80	40.4	33–47	83	86.5	80–94	169	80.1	75–85	203	72.5	68–78	52	65.8	56–76
Cryotherapy warts	167	84.3	79–89	14	14.7	8–22	141	66.8	61–73	153	54.4	48–60	76	95.0	90–100
IV infusion	52	26.4	20–32	37	38.9	29–49	7	3.3	1–5	178	63.3	57–69	21	26.6	17–37
Diagnoses[b]															
Bronchitis	194	99.0	98–100	96	100.0	NA	209	99.1	98–100	269	95.4	92–98	77	96.3	92–100
Pneumonia	195	99.5	98–100	96	100.0	NA	212	100.0	NE	249	88.9	85–93	77	100.0	NA
Myocardial Infarction	172	87.8	83–93	78	81.3	73–89	163	76.9	71–83	205	73.0	68–78	38	47.5	37–59
Heart failure	183	93.4	89–97	94	98.9	97–100	199	94.3	91–97	266	94.3	91–97	57	71.3	61–81
Rheumatoid arthritis	195	99.0	98–100	68	70.8	62–80	139	65.6	60–72	230	81.6	77–87	45	56.3	45–67
Parkinson's disease	153	78.1	72–84	58	61.1	51–71	134	63.5	58–70	185	65.8	61–71	25	31.3	21–41
Diabetes type 2	197	100.0	NA	96	100.0	NA	210	100.0	NA	266	94.3	91–97	78	98.7	97–100
Peptic ulcer	183	93.4	91–97	92	95.8	92–100	203	95.8	93–99	239	84.8	81–89	66	82.5	75–91
Disc herniation	195	99.5	98–100	95	99.0	97–100	209	98.9	98–100	251	89.0	85–93	80	100.0	NA
Depression	195	99.0	98–100	95	99.0	97–100	210	99.1	98–100	259	91.8	89–95	79	98.8	97–100
Hordeolum	166	84.7	80–90	87	90.6	85–97	201	94.8	92–98	213	75.8	71–81	77	96.3	92–100
Peritonsillar abscess	117	60.3	53–67	59	61.5	52–72	167	78.8	74–84	179	63.5	58–70	22	27.8	18–38

NA: not applicable due to separation of the material.
[a]Question: To what extent are the following activities carried out in your practice population by you (or your staff) and not by a medical specialist (practice population means: people who normally apply to you for primary medical care)?
[b]Question: To what extent are you involved in the treatment and follow-up of patients in your practice population with the following diagnoses?

and age, number of consultations per day and distance to the nearest hospital. We compared each country to all other countries in four separate regression models. To adjust for this multiple testing, we used the Bonferroni correction, giving a significance level of $p \leq 0.0125$ for the logistic regression analyses. For all other analyses, the significance level was set to $p \leq 0.05$. Odds ratios (OR) are given with 95% CI. Analyses were done in IBM SPSS Statistics 22 (SPSS Inc., Chicago, IL).

Results

Demographics

Responses from 875 Nordic GPs (Norway 198, Sweden 97, Denmark 212, Finland 288 and Iceland 80) were included in the analyses. Characteristics of the GPs are found in Table 1.

Medical equipment

Table 2 shows details concerning the equipment available to the GPs. Basic medical equipment was available in virtually all practices. A selection of point-of-care laboratory equipment was available in all countries, but the details vary. In Iceland, hardly any of the GPs had a coagulometer (3.8%), and this was also less common in Finland (26.8%) than in the other countries. In Norway and Denmark, cholesterol meters were uncommon (respectively 9.6% and 3.8%).

Basic technical equipment like blood pressure monitors and otoscopes were available in more than 92% of GP practices in all countries. Electrocardiographs were present in more than 95% of all practices in all countries except Denmark (83%). More advanced technical equipment was almost exclusively present at Finnish GPs' offices: X-ray (62.7%), gastroscope (29.2%), sigmoidoscope (29.2%) and bicycle ergometer (31%). Abdominal ultrasound was available for over 50% of Finnish GPs, whereas only 4% of the Swedish GPs had this equipment. Microscopes were present in 62–73% of practices in all countries except Finland (23%). Defibrillators were very common in Sweden (96.9%), Finland (95.7%) and Iceland (96.3%), less so in Denmark (37.3%) and Norway (65.2%).

Treatment and follow up of patients with listed diagnoses

The GPs indicated from a predefined list the different medical conditions in which they always or usually were involved in treatment and/or follow-up (Table 3).

Association with demographic factors (crude numbers, not shown in table): GPs with practices located ≤20 km

from the nearest hospital were less likely to be involved in the treatment and follow-up of Parkinson's disease, OR 0.6 (0.4–0.8); peritonsillar abscess, OR 0.6 (0.4–0.8); and myocardial infarction, OR 0.6 (0.4–0.9). Male GPs were more likely than female GPs to be involved in the treatment of peritonsillar abscess, OR 1.4 (1.4–2.0); Parkinson's disease, OR 2.1 (1.5–2.9); rheumatoid arthritis, OR 1.5 (1.1–2.1); and myocardial infarction, OR 1.5 (1.02–2.1).

Differences on country level: Differences between countries are shown in Table 4. Between 95 and 100% of the GPs in all five countries indicated that they were involved in treatment or follow-up of chronic obstructive pulmonary disease (COPD), pneumonia, and type-2 diabetes.

Icelandic GPs were significantly less involved in the treatment of myocardial infarction, heart failure and peritonsillar abscesses than the GPs in all other countries. The Norwegian and Finnish GPs were significantly more involved in the treatment of rheumatoid arthritis than the GPs in the other countries. Norwegian GPs were significantly more involved in the treatment of Parkinson's disease than GPs in Denmark and Iceland.

Procedures

The procedures performed by the GPs are shown in Table 3.

Association with demographic factors (crude numbers, not shown in table): The following procedures were carried out less frequently when the distance to hospital was ≤20 km compared with >20 km: wound sutures, OR 0.2 (0.1–0.5); removal of sebaceous cysts, OR 0.5 (0.3–0.7); insertion of intrauterine devices (IUDs), OR 0.5 (0.3–0.8); joint injections, OR 0.4 (0.3–0.6); strapping of ankle, OR 0.6 (0.4–0.9); and intra-venous infusion, OR 0.3 (0.2–0.5).

Male GPs inserted IUDs less often than female GPs, OR 0.4 (0.3–0.6). However, wound sutures, OR 1.67 (1.1–6.7); wedge resection of toe nails, OR 2.2 (1.4–3.3); removal of sebaceous cyst, OR 1.8 (1.3–2.6); wart excisions, OR 1.5 (1.1–2.0); fundoscopy, OR 1.5 (1.02–2.2); strapping of ankles, OR 1.5 (1.04–2.04); and joint injections, OR 1.9 (1.3–2.8) were done significantly more often by male GPs.

Differences on country level: Table 5 shows the inter-country differences in performed procedures. Danish and Norwegian GPs were significantly more likely to insert IUDs than GPs in all other countries. Danish GPs did removal of sebaceous cysts, wedge resection of toenails, fundoscopy and intravenous infusion less often than GPs in all other countries, and less wound

Table 4. Associations (odds ratio (95% CI)) between country and treatment/follow-up of different diagnoses. Logistic regression adjusted for GP sex, age, number of consultations per day and distance to hospital.

Model	Bronchitis	Pneumonia	Myocardial Infarction	Heart failure	Rheumatoid arthritis	Parkinson's disease	Diabetes type 2	Peptic ulcer	Disc herniation	Depression	Hordeolum	Peritonsillar abscess
1. Ref Norway												
Sweden	NA	NA	0.8 (0.4–1.6)	9.2 (1.1–75.1)	**0.3 (0.2–0.6)**	0.5 (0.3–1.0)	NA	1.9 (0.6–6.4)	0.5 (0.03–9.1)	0.9 (0.1–10.6)	1.8 (0.08–4.2)	1.1 (0.7–2.0)
Denmark	0.9 (0.1–7.1)	NA	0.6 (0.3–1.0)	0.9 (0.4–2.1)	**0.2 (0.1–0.4)**	**0.5 (0.3–0.8)**	NA	1.1 (0.4–2.8)	0.4 (0.04–4.0)	1.2 (0.2–8.8)	**3.0 (1.4–6.4)**	**2.8 (1.7–4.5)**
Finland	0.4 (0.1–2.1)	0.1 (0.01–0.9)	**0.4 (0.3–0.8)**	2.0 (0.8–4.7)	0.7 (0.4–1.2)	0.7 (0.5–1.2)	NA	0.6 (0.3–1.3)	**0.04 (0.01–0.4)**	**0.1 (0.02–0.5)**	0.6 (0.4–1.1)	1.3 (0.8–2.0)
Iceland	0.7 (0.1–6.2)	NA	**0.2 (0.1–0.3)**	**0.2 (0.1–0.5)**	**0.2 (0.1–0.3)**	**0.1 (0.1–0.3)**	NA	0.3 (0.1–0.9)	NA	0.7 (0.1–7.9)	4.4 (1.3–15.6)	**0.3 (0.2–0.5)**
2. Ref Finland[a]												
Sweden	NA	NA	1.7 (0.9–3.1)	4.7 (0.6–36.4)	**0.5 (0.3–0.8)**	0.7 (0.4–1.2)	NA	3.3 (1.1–9.5)	12.2 (1.6–92.3)	8.9 (1.2–68.5)	**2.9 (1.3–6.1)**	0.9 (0.6–1.5)
Denmark	2.3 (0.3–16.1)	NA	1.3 (0.7–2.3)	0.5 (0.2–1.3)	**0.3 (0.2–0.5)**	0.7 (0.4–1.2)	NA	1.9 (0.7–5.2)	**9.0 (2.0–40.8)**	**11.5 (2.0–64.8)**	**4.7 (2.0–10.8)**	**2.2 (1.3–3.9)**
Iceland	2.0 (0.4–9.8)	NA	**0.4 (0.2–0.6)**	**0.1 (0.1–0.3)**	**0.2 (0.1–0.4)**	**0.2 (0.1–0.3)**	4.7 (0.5–40.1)	0.6 (0.3–1.2)	NA	6.6 (0.8–53.2)	**7.0 (2.1–23.6)**	**0.2 (0.1–0.4)**
3. Ref Denmark[b]												
Sweden	NA	NA	1.4 (0.7–2.8)	10.5 (1.2–92.1)	1.6 (0.8–3.1)	1.1 (0.6–2.0)	NA	1.7 (0.4–6.6)	1.4 (0.1–15.3)	0.8 (0.1–10.1)	0.6 (0.2–1.7)	**0.4 (0.2–0.8)**
Iceland	0.9 (0.1–7.8)	NA	**0.3 (0.1–0.6)**	**0.3 (0.1–0.7)**	0.8 (0.4–1.5)	**0.3 (0.1–0.5)**	NA	0.3 (0.1–0.9)	NA	0.6 (0.1–7.4)	1.5 (0.4–6.0)	**0.1 (0.1–0.2)**
4. Ref Sweden[c]												
Iceland	NA	NA	**0.2 (0.1–0.4)**	**0.02 (0.0–0.2)**	0.5 (0.3–0.9)	**0.3 (0.1–0.5)**	NA	**0.2 (0.1–0.6)**	NA	0.7 (0.04–12.3)	2.5 (0.6–9.5)	**0.2 (0.1–0.5)**

Bold figures: $p \leq 0.0125$. NA: not applicable due to separation of the material.
[a]Comparison with Norway in model 1.
[b]Comparisons with Norway and Finland in models 1 and 2, respectively.
[c]Comparisons with Norway, Finland and Denmark in models 1, 2 and 3, respectively.

Table 5. Associations (odds ratio (95% CI)) between country and procedures performed by the GPs or their staff. Logistic regression adjusted for sex, age, number of consultations per day and distance to hospital.

Model	Suture	IUD	Fundoscopy	Joint injection	Strapping of ankle	Cryotherapy of warts	Intravenous infusion	Wedge resection toenail	Removal of sebaceous cyst	Wart excision
1. Ref Norway										
Sweden	NA	**0.02 (0.01–0.1)**	**0.3 (0.2–0.6)**	**11.6 (5.1–26.3)**	**11.5 (5.6–23.8)**	**0.04 (0.02–0.1)**	1.6 (0.9–3.0)	**14.9 (5.4–41.0)**	**3.9 (1.8–8.4)**	**0.2 (0.1–0.3)**
Denmark	0.1 (0.0–0.2)	0.6 (0.3–1.2)	**0.01 (0.0–0.02)**	0.7 (0.4–1.1)	**5.2 (3.2–8.5)**	**0.3 (0.2–0.6)**	**0.1 (0.04–0.2)**	**0.09 (0.1–0.2)**	**0.4 (0.2–0.6)**	**0.3 (0.2–0.4)**
Finland	1.2 (0.5–2.8)	**0.2 (0.1–0.4)**	1.1 (0.7–1.8)	**32.1 (15.4–66.7)**	**5.2 (3.2–8.4)**	**0.3 (0.2–0.4)**	**5.1 (3.1–8.4)**	**10.7 (5.7–19.9)**	**2.6 (1.5–4.3)**	0.7 (0.4–1.2)
Iceland	0.3 (0.1–0.8)	**0.02 (0.01–0.1)**	**0.1 (0.04–0.2)**	**4.4 (2.2–9.0)**	**3.1 (1.7–5.8)**	**8.3 (1.9–36.4)**	1.1 (0.6–2.2)	**4.8 (2.2–10.8)**	0.9 (0.5–1.8)	1.5 (0.7–3.1)
2. Ref Finland[a]										
Sweden	NA	**0.1 (0.1–0.2)**	**0.3 (0.2–0.5)**	0.4 (0.1–0.9)	2.2 (1.1–4.3)	**0.2 (0.1–0.3)**	**0.3 (0.2–0.5)**	1.4 (0.5–3.8)	1.5 (0.8–3.1)	**0.2 (0.1–0.4)**
Denmark	**0.1 (0.03–0.2)**	**2.7 (1.4–5.4)**	**0.01 (0.0–0.02)**	**0.02 (0.01–0.1)**	1.0 (0.6–1.8)	1.3 (0.8–2.2)	**0.02 (0.01–0.04)**	**0.01 (0.0–0.02)**	**0.1 (0.1–0.3)[a]**	**0.4 (0.2–0.7)**
Iceland	**0.3 (0.1–0.6)**	**0.1 (0.04–0.2)**	**0.1 (0.04–0.1)**	**0.1 (0.1–0.3)**	0.6 (0.3–1.1)	**31.2 (7.4–131.6)**	**0.2 (0.1–0.4)**	0.5 (0.2–1.0)	**0.4 (0.2–0.7)**	2.1 (1.1–4.1)
3. Ref Denmark[b]										
Sweden	NA	**0.04 (0.02–0.1)**	**36.9 (14.9–91.8)**	**16.9 (7.0–41.0)**	2.2 (1.0–4.9)	**0.1 (0.1–0.2)**	**19.1 (7.2–50.3)**	**174.9 (56.9–537.7)**	**11.3 (5.0–25.5)**	0.6 (0.3–1.1)
Iceland	**3.7 (1.7–8.2)**	**0.03 (0.01–0.1)**	**8.9 (3.5–23.0)**	**6.4 (3.0–13.9)**	0.6 (0.3–1.2)	**24.2 (5.5–106.1)**	**12.9 (4.7–35.5)**	**11.7 (6.7–20.6)**	**2.7 (1.3–5.3)**	**5.6 (2.6–12.0)**
4. Ref Sweden[c]										
Iceland	NA	0.9 (0.4–2.1)	**0.2 (0.1–0.5)**	0.4 (0.2–0.9)	**0.3 (0.1–0.6)**	**213.5 (46.7–976.8)**	0.7 (0.3–1.4)	0.3 (0.1–1.0)	**0.2 (0.1–0.5)**	**10.1 (4.8–21.3)**

Bold figures: $p < 0.0125$. NA: not applicable due to separation of the material.
[a]Comparison with Norway in model 1.
[b]Comparisons with Norway and Finland in models 1 and 2, respectively.
[c]Comparisons with Norway, Finland and Denmark in models 1, 2 and 3, respectively.

sutures than GPs in Iceland and Finland. Finnish GPs administrated intravenous infusion more frequently than GPs in any of the other countries.

Discussion

We found several differences between the services provided by GPs in the Nordic countries. Danish GPs performed several procedures significantly less frequent than GPs in all other countries, although they inserted IUDs significantly more often than GPs in Sweden, Iceland and Finland. Finnish GPs performed a majority of the medical procedures more frequently than GPs in the other countries.

GPs in Iceland reported involvement in a more narrow selection of the medical conditions than GPs in the other countries. Finnish GPs had more advanced technical medical equipment than GPs in all other countries.

It was otherwise difficult to identify obvious patterns in the differences between the countries; there was no clear indication of GPs in one country doing consistently more procedures, having consistently more equipment and treating a larger diversity of medical conditions than GPs in the other countries.

Strengths and weaknesses

Our material allows for international comparison, as we used the same questionnaire in all countries during the same period. In Norway, Finland, Denmark and Iceland, GPs were recruited nationwide. The distribution of the GPs' age and gender was representative for the countries [13].

Finland and Iceland obtained the required number of GPs, whereas Norway obtained 90% and Denmark 96%. This was deemed sufficient for the use in statistical analysis. In Sweden, only 97 GPs (44% of goal) took part in the study, in spite of several reminders. The Swedish results must, therefore, be interpreted with care.

The questionnaires were designed and validated for an international study [12]. Thus, the questions were not specifically designed to map general practice in the Nordic countries. For Nordic circumstances, some of the items in the predefined tick-off lists may be construed as redundant or irrelevant (e.g. disposable gloves, refrigerator), whereas others were missed (e.g. dermatoscope, CRP measurement).

We used distance to hospital as a marker of an urban/rural location. However, in the QUALICOPC questionnaire, '>20 km to the nearest hospital' was the maximum distance indicated. In a Nordic context, many practices will be situated considerably further away from a hospital.

Our data give information about daytime general practice, the situation in out-of-hours care is not covered by our study. All information was based on the GPs self-reporting. We have no reason to believe that the differences are due to unreliable answers from the doctors.

Interpretation of results and comparison with other studies

In 2014, the Nordic Council of Ministers for Health and Social Affairs released a common strategy [14] that stressed the importance of working together to enhance quality and safety in health services. However, international comparisons of services can be challenging, as different countries have different allocation of tasks within the health care system.

In 1993, the European Task Profile Study investigated the range of services offered by GPs in 30 European countries, showing a strong position of primary care in the Scandinavian countries (Norway, Denmark and Sweden) [2]. When comparing data from 1993 with the QUALICOPC data from 2013, a relative increase in the GPs' participation in disease management was found in all the Nordic countries [3]. For performance of minor technical procedures, Iceland, Denmark and Finland showed a relative decrease in the same period, whereas there was an increase in Sweden and Norway.

Geographical location may affect the service provision in general practice. Lower referral rates in rural areas have previously been found in Canada [15], and the use of outpatient specialist care was lower in smaller and more distant municipalities communities in Norway [16]. In Denmark, the distance to the nearest specialist or hospital is often considerably shorter than in sparsely populated areas such as large parts of Norway, Finland and Sweden. In areas with long travel-distance to the nearest specialist, it is likely that the GPs will offer more diagnostic and therapeutic procedures irrespective of remuneration systems. An association with distance to hospital was found for several procedures in our study.

In Denmark and Norway, fee-for-service remuneration (public reimbursement and, in Norway, patient co-payment) constitutes an estimated 70 of the direct income for the GPs [17,18]. The services offered by the GPs in these countries may be influenced by the remuneration for the procedures in relation to the GPs expenses. This may explain some of the differences seen in our study. Wedge resections of toenails were

less commonly done in Norway and Denmark than in the other countries. Time-consuming surgical procedures may be deprioritised if not considered sufficiently reimbursed.

Some differences in equipment can be explained by organisational variations. The Finnish GPs had a rather different profile than the other countries, with high availability of advanced technical equipment. This may in part be because some Finnish health centres used to be small local hospitals, and as such have a tradition of offering more specialised services. Still, only 66% of the Finnish GPs had spirometers, whereas this was available to more than 95% of GPs in all other countries. The service is in Finland traditionally offered in other locations than the primary care centres. In Denmark, only 1% of the GPs had eye tonometers, probably reflecting that the Danish patients can go directly to the ophthalmologist without referral.

In our results, we see a possible effect of gate-keeping. In Iceland, where there is effectively no gate-keeping, the GPs treated conditions such as rheumatoid arthritis, Parkinson's disease, heart failure and myocardial infarction significantly less often than in the other Nordic countries. We assume that Icelandic patients with these conditions are followed by relevant specialists.

Treatment traditions and habits also seem to affect the services provided in general practice. In Norway, the procedure 'strapping of ankle' was performed less often than in all other countries. This may not necessarily be considered a doctor's task; it is quite common to instruct the patients to do this themselves.

Conclusion and implications

GPs in the Nordic countries were generally well equipped, performed a wide spectrum of medical procedures and were involved in the follow-up of a wide selection of diagnosis. There are, however, differences that may be associated with variations in remuneration systems, geographical variations and other organisational factors.

If GPs are to take on an increased amount of tasks, a better understanding of what is at present offered in general practice is imperative. Experiences from other countries can be valuable. Differences should be investigated as a political and organisational as much as a medical issue.

Ethics

The QUALICOPC study was presented to the relevant ethic committees in the Nordic countries. The study was approved by the Danish Data Agency, the Ethical Committee of the Pirkanmaa Hospital District in Finland, the Regional Ethical Review Board of Linköping in Sweden (Dnr 2011/481-31; Dnr 2013/120-32) and the Icelandic National Bioethics Committee. The Regional Committee for Medical and Health Research Ethics in South-Eastern Norway concluded that their approval was not required for this study.

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Disclosure statement

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Notes on contributors

Torunn Bjerve Eide is a GP specialist and PhD student at the Department of General Practice, Institute of Health and Society, at the University of Oslo, Norway.

Jørund Straand is a professor and Head of Department at the Department of General Practice, Institute of Health and Society, at the University of Oslo, Norway.

Cecilia Björkelund is a professor at the Department of Primary Health Care, Institute of Medicine, University of Gothenburg, Sweden.

Elise Kosunen is a professor at the Department of General Practice, University of Tampere, Finland.

Ofeigur Thorgeirsson is a GP at the Grafarvogur Primary Care Centre, Reykjavik, Iceland.

Peter Vedsted is a professor of Primary Care at the Research Unit for General Practice, and Professor of Innovative Patient Pathways at Silkeborg Diagnostic Centre, Aarhus University, Denmark.

Elin Olaug Rosvold is a professor at the Department of General Practice, Institute of Health and Society, at the University of Oslo, Norway, and Head of the Norwegian Research School in General Practice.

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RESEARCH ARTICLE Open Access

Patient experiences and the association with organizational factors in general practice: results from the Norwegian part of the international, multi-centre, cross-sectional QUALICOPC study

Torunn Bjerve Eide[1*], Jørund Straand[1], Hasse Melbye[2], Guri Rortveit[3,4], Irene Hetlevik[5] and Elin Olaug Rosvold[1]

Abstract

Background: General practitioners (GPs) constitute a vital part of a strong primary health care system. We need further knowledge concerning factors that may affect the patients' experiences in their meetings with the GPs. We investigated to what degree organizational factors and GP characteristics are associated with patients' communicative experiences in a consultation.

Methods: We used data from the Norwegian part of the international, multi-center study Quality and Costs of Primary Care in Europe (QUALICOPC). We included 198 Norwegian GPs and 1529 patients. The patients completed a survey concerning experiences in a consultation with a GP on the inclusion day. The GPs completed a survey regarding organizational aspects of their own practice. Main outcome measures were seven statements concerning how the patients experienced the communication with the GP during the consultation. A generalized estimating equation logistic regression model was used to identify variations in patient experiences associated with characteristics of the GPs and their practices.

Results: The patients reported overall positive experiences with their GP consultations. Patients who consulted a GP with a short patient list were less likely than patients who consulted a GP with a medium sized list to regard the GP as polite (Odds Ratio (OR) 0.2; 95 % CI 0.1–0.7), to report that the GP asked questions about their health problems (OR 0.6; 0.4–1.0) or that the GP used sufficient time (OR 0.5; CI 0.3–0.9). Patients who consulted a GP with a long patient list compared to patients who consulted a GP with a medium sized list were less likely to feel that they could cope better after the GP visit (OR 0.5; 0.3–0.9) and more likely to feel that the GP hardly looked at them while talking (OR 1.8; 1.0–3.0). No associations with patient experiences were found with the average duration of the consultations, whether the GP worked in a fee-for-service model or whether the GP was the patient's regular doctor.

Conclusions: Norwegian patients report predominantly positive experiences when consulting a GP. Positive communication experiences are most likely to be reported when the GP has a medium sized patient list.

Keywords: Primary health care, General practice, Patient satisfaction, Physician-patient relations, QUALICOPC, Norway, Health-services administration

Abbreviations: GEE, General estimating equations; GP, General practitioner; NIVEL, Netherlands Institute for Health Services Research; QUALICOPC, Quality and Costs of Primary Care in Europe

* Correspondence: torunn.bjerve.eide@gmail.com
[1]Department of General Practice, Institute for Health and Society, University of Oslo, Oslo, Norway
Full list of author information is available at the end of the article

Background

Primary health care is increasingly acknowledged as the linchpin of a strong health care system [1, 2]. Most European health authorities have a common vision of a strong primary health care system, but there is substantial inter-country variation of the frame-work provided for the GPs' work. Reforms are frequently discussed or being implemented, and knowledge concerning aspects that may affect the quality of primary health care provision is of value to political decision-makers. Three main dimensions of primary care have been identified: *Structure* (governance, economic conditions and workforce development), *process* (access, continuity of care, coordination of care and comprehensiveness of care), and *outcome* (quality of care, efficiency of care, equity in health) [3]. Patients' perceived satisfaction with the medical help they receive from their GP will to a large extent be coloured by the process-aspects, while it is more difficult for lay people to evaluate the medical quality and appropriateness of received care.

Patient satisfaction has been commonly used as an indicator of the quality of primary health care systems and individual health suppliers in different contexts [4, 5]. The concept of quality as applied in health services research is, however, often unclear, and the definitions vary [6]. Over the recent years the tendency has been to survey patients' actual experiences instead of evaluating their more general satisfaction with health care services [7, 8]. We have scarce information on whether the organisational aspects of primary care may affect the patients' experiences.

The main aspects of consultations with a GP, as judged by patients, have been reported to be the interaction with the doctor and the outcome of the consultation [9]. In addition, information, continuity of care, and available time with the doctor were considered important factors. In a recent Norwegian study, there was an association between the patients' satisfaction with the access to care and the GPs' service production, whereas no associations were found with time spent in consultation or whether the patients perceived that the GP took their medical problem seriously [10].

The frame-work of primary care varies throughout Europe. In Norway most GPs are self-employed, and as such have substantial freedom in terms of how they organize their practices [11, 12]. There are considerable differences when it comes to the size of the GPs' patient lists, the number of colleagues with shared facilities, whether they employ nurses or health secretaries, how many days per week and hours per day they choose to be in office, which medical procedures they carry out, whether they offer home visits and to what extent they are reachable for the patients by phone, SMS or e-mail. Through the annual Commonwealth Fund International Health Policy Survey, we have information both regarding GPs evaluation of their own practices and their interaction with the health care systems [13], and about patients' experiences with the primary care system [14, 15]. There are, however, few studies that permit analyses based on linked information between individual patients and their regular GP, and we therefore have little knowledge regarding how organizational aspects in the GP's practice affect the patients' experience. With the present study, we wish to investigate this potential association. We analyze Norwegian data with the aim to identify how the patients' experiences vary with characteristics of the corresponding GPs and the organisational factors of their practices.

Methods

The QUALICOPC (Quality and Costs of Primary Care in Europe) study is a multi-centre study that comprises 34 countries [16]. A set of four questionnaires was developed by the QUALICOPC Partner Consortium, led by the Netherlands Institute for Health Services Research (NIVEL). The rational of the construction of the questionnaires and the full version of their content has been published elsewhere [17]. The questionnaires were translated into the languages of the participating countries by a "forth and back" translation procedure, and a few of the questions were adjusted to fit the different national settings. The survey set consisted of: 1) A GP questionnaire concerning organisational aspects of the GP's practice, the health problems and procedures handled in the practice and the range of medical equipment available for the GP. 2) A patient questionnaire concerning experiences with one specific GP consultation and with this GP's practice, and also concerning which health problems the patients expected the GP to be of help with. 3) A patient questionnaire concerning how the patients valued the different aspects of primary care. 4) A fieldworker questionnaire concerning the practice facilities. In each participating medical practice, fieldworkers consecutively invited ten patients ≥18 years who had a face-to-face consultation with the participating GP on a randomly selected day. The patients' surveys were completed in the GPs waiting room on the day of the consultation. Per participating GP, nine patients answered the patient experiences survey, one patient answered the patient values survey, and one fieldworker survey per GP was completed. Fieldworkers in Norway were either study coordinators, students or health secretaries working in the practice. The fieldworkers and the participating GPs each received a gift voucher of approximately 45 euro. The patients did not receive payment for participation. All GP and patient surveys were answered anonymously. A unique identification number linked GP

responses to the responses of his/her patients and the fieldworker survey.

Sample

The study is based on data from the Norwegian part of the QUALICOPC study. Data collection took place from November 2012 to April 2013. The four Norwegian General Practice Research Units at the Universities of Oslo, Trondheim and Tromsø and the research institute Uni Research Health in Bergen were all involved in recruiting doctors and patients to the study, thus ensuring that we received information from the entire country. GPs were contacted via formal and informal GP networks, and those who were willing to participate were sent a survey set or received a visit from a fieldworker. The Norwegian material consists of information from 198 GPs and 1704 patients. In total, 1529 patient completed the experience form and 175 completed the values form.

Measures

The present study uses data from the patient experiences and the GP questionnaires. Table 1 presents an overview of all variables included in our analyses. The following independent variables described the organisational features of the GP's practice: the size of the patient list, the average consultation time as judged by the individual GP, whether the GP had a fixed salary or a fee for service system, and the geographical location of the practice. We identified seven outcome variables that gave information on how the patients experienced their visit at the doctor's office and, in particular, the communication with the doctor (Table 1). Continuous variables were transformed into categorical data as indicated in Table 1.

Statistical analysis

Due to the hierarchical structure of the data, we used a generalized estimating equation (GEE) logistic regression model. This modelling technique helped to account for the variability in patients' experiences between the GPs and to establish any variation at the GP level. The significance level was set to $p < 0.05$.

All analyses were performed using SPSS statistics 22.

Results

Tables 2 and 3 present demographic characteristics of the 1529 patients and 198 doctors. A majority of the patients (89.3 %) consulted with their regular doctor. Among the GPs, 39.1 % were female. The mean patient list size was 1093, with a tendency among the female GPs to have shorter lists than the male GPs (1049 versus 1123).

Table 1 Items from the QUALICOPC questionnaires included as variables in this study

Variables	Response alternatives
Information from the patients	
Gender	Male/female
Age	Years (<30, 30–65, >65)[a]
Did you see your regular doctor today?	Yes/No
The doctor was polite	Yes/No
The doctor listened carefully to me	Yes/No
The doctor asked questions about my health problem	Yes/No
The doctor took sufficient time in today's consultation	Yes/No
The doctor hardly looked at me when we talked	Yes/No
I couldn't really understand what the doctor was trying to explain	Yes/No
After this visit, I can cope better with my health problem/illness	Yes/No[b]
Information from the doctor	
Gender	Male/female
Age	Years (≤35, 36–59, ≥ 60)[a]
Geographical location of practice	1. Big city /Suburbs/ Small town; grouped as Urban 2. Mixed urban–rural / Rural; grouped as Rural
Size of patient list	Number of patients (≤900, 901–1300, >1300)[a]
Form of employment	Fixed salary / Fee for service
Duration of an average consultation (as assessed by the GP)	Minutes (≤17 min, >17 min)[a]

[a]The age of patients and doctors, the size of patient lists and the duration of consultations were all continuous variables divided into groups before analysis. Groups were defined according to the distribution of the material (see Tables 2 and 3)
[b]401 patients answered "I don't know". These were recoded into missing

Table 2 Demographic data of participating patients (percentages in brackets)

	Total	Women	Men
Total	1529 (100)	916 (61.9)[a]	564 (38.1)[a]
Age[b]			
Range	18–93	18–91	18–93
Mean	48.7	46.2	52.5
Education[c]			
Primary school	194 (13.4)	118 (13.1)	75 (13.8)
High-school/college	591 (40.8)	355 (39.4)	236 (43.3)
Higher education	663 (45.8)	429 (47.6)	234 (42.9)
Visited their regular GP?[d]			
Yes	1321 (89.1)	796 (89.3)	482 (88.6)
Patients with a chronic condition[e]	764 (51.1)	445 (49.6)	289 (52.7)
Patient's evaluation of own health[f]			
Very good	243 (16.2)	164 (18.3)	73 (13.2)
Good	741 (49.4)	428 (47.7)	289 (52.4)
Fair	382 (25.5)	222 (24.7)	149 (27.0)
Poor	133 (8.9)	84 (9.4)	41 (7.4)

Number of missing values: [a] 49, [b] 59, [c] 81, [d] 51, [e] 34, [f] 30

Table 3 Demographic data of participating GPs (percentages in brackets)

	Total	Female	Male
Total	198 (100)	77 (39.1)[a]	120 (60.9)[a]
Age			
Range	28–69	28–68	28–69
Mean	45.7	43.4	47
Born in Norway[b]	160 (81.6)	65 (84.4)	94 (79.7)
Geographical location of practice[c]			
Big inner city	66 (33.8)	29 (38.7)	36 (30.3)
Suburbs	27 (13.8)	12 (16.0)	15 (12.6)
Small town	44 (22.6)	14 (18.7)	30 (25.2)
Mixed urban–rural	31 (15.9)	7 (9.3)	24 (20.2)
Rural	27 (13.8)	13 (17.3)	14 (11.8)
Size of patient list[a]			
Range	250–1800	400–1500	250–1800
Mean	1093.4	1048.9	1122.6
Form of employment			
Fee for service	181 (91.4)	70 (90.9)	110 (91.7)
Fixed salary	17 (8.6)	7 (9.1)	10 (8.3)
Duration of average consultation as assessed by GP (minutes)			
Range	10–30	15–25	10–30
Mean	18.6	19.1	18.3

Number of missing values: [a] 1, [b] 2, [c] 3

Patients' reports from their consultation with the GP were generally positive. A great majority of the patients reported that the GP was polite (97.9 %), listened carefully (97.1 %) and took sufficient time (91.1 %) (Table 4). Most patients (88 %) also reported that they could cope better with their health problems after the visit. On the other hand, few patients experienced that the doctor hardly looked at them (7.4 %) or that they could not understand what the doctor was trying to explain (8.0 %). Table 4 presents the number and percentage of patients giving a positive response to the statements in Table 1 for each of the subgroups of the GPs.

Table 5 presents the results of the multivariate GEE logistic regression analyses. When analysing the impact of list size, we defined the patients visiting GPs with a medium sized list (901–1300 patients) as the reference group. Patients visiting a GP with a shorter patient list were less likely to respond positively to the statements "The doctor was polite" (OR 0.2; CI 0.1–0.7), "The doctor asked questions about my health problem" (OR 0.6; CI 0.4–1.0) and "The doctor took sufficient time" (OR 0.5; CI 0.3–0.9). Patients visiting a GP with a longer patient list were less likely to answer yes to the statement "After this visit, I can cope better with my health problem/illness" (OR 0.5; CI 0.3–0.9). When using patients that visited GPs with smaller lists as the reference group, no additional significant differences were found.

Patients visiting a GP in a rural area were more likely to answer yes to the statement "I couldn't really understand what the doctor was trying to explain" (OR 1.8; CI 1.2–3.0) compared to patients visiting doctors in an urban area.

When analysing the impact of the doctors' age, the middle age group (36–59 years) was defined as reference. Patients visiting a GP aged 60 years or more were less likely to answer yes to the statement "The doctor asked questions about my health problem" (OR 0.5; CI 0,3–0,8). This was also true when compared to patients visiting GPs in the youngest age group (OR 0.4; CI 0.2–0.9). This was the only significant association found with the GPs' age.

When analysing the impact of the patients' age, we also defined the middle age group (30–65 years) as the reference. Patients less than 30 years old were more likely to answer yes to whether the doctor asked questions about their health problems (OR 2.3; CI 1.1–4.6). Patients above 65 years were more likely than the middle aged patients to answer yes to the statements "The doctor hardly looked at me when we talked" (OR 1,7; CI 1.0–2.9), and "After this visit, I can cope better with my health problem/illness" (OR 4.7; CI 1.8–12.3). When using the youngest age group as reference, additional differences were identified: Both the middle age group (OR 0.4; CI 0.2–0.9) and the oldest age group (OR 0.3; CI 0.1–0.6) were less likely to state that the GP asked

Table 4 Percentages of patients that answered yes to each question

	GP was polite[a]	GP listened carefully[a]	GP hardly looked at me when we talked[a]	GP asked questions about my health problem[a]	I couldn't really understand what the GP was trying to explain[a]	GP took sufficient time[a]	After this visit, I can cope better with my health problem[b]
Total ($n = 1529$)	97.9	97.1	7.4	90.3	8.0	91.1	87.9
Patient's gender[c]							
Male (545)	98.7	97.2	7.2	89.7	7.5	93.2	89.0
Female (890)	98.0	97.3	7.5	91.3	8.1	90.1	87.7
Patient's age[d]							
< 30 (219)	99.1	97.7	7.8	94.5	9.1	93.6	84.2
30–65 (928)	98.3	97.5	6.4	90.9	6.6	90.5	86.9
> 65 (278)	97.5	95.7	9.7	87.1	10.8	92.1	97.3
Did you see your regular doctor?[e]							
Yes (1297)	98.1	97.5	7.5	90.9	7.6	92.0	88.8
No (156)	97.4	94.2	7.7	86.5	9.6	87.8	77.7
GP's gender[f]							
Male (868)	98.0	97.7	7.6	90.4	7.6	91.5	88.5
Female (546)	97.8	96.3	6.6	90.7	8.6	91.6	88.1
GP's age[g]							
< =35 (203)	98.0	99.0	8.4	91.1	9.9	91.6	87.8
36–59 (1085)	98.0	96.9	7.2	91.2	8.1	91.4	88.1
> =60 (133)	97.7	97.0	5.3	84.2	3.8	92.5	92.0
Geographical location[h]							
Urban (1042)	98.1	97.5	6.7	91.4	7.2	91.7	88.2
Rural (366)	97.5	96.2	8.7	88.3	10.4	91.0	88.7
List size[i]							
>1300 (367)	98.6	98.0	9.6	91.8	9.0	90.1	85.5
900–1300 (784)	98.4	96.7	5.9	91.1	7.3	93.2	90.8
< 900 (327)	96.1	97.4	7.7	88.1	8.7	89.4	85.9
Employment of GP[j]							
Fixed salary (81)	97.5	97.5	3.7	90.1	8.6	93.8	85.4
Fee for service (1340)	98.0	97.2	7.4	90.6	7.9	91.4	88.5
Average duration of consultation[k]							
≤ 17 min (498)	97.9	97.7	7.4	89.7	7.8	89.1	87.1
> 17 min (967)	98.2	97.1	7.1	91.2	8.1	92.9	88.9

Number of missing values: [a]49, [b]518 (see Table 1), [c]94, [d]104, [e]76, [f]115, [g]108, [h]121, [i]102, [j] 108, [k]64

The left column indicates subgroups of patients according to characteristics of the patients or the GP they attended

Table 5 Associations between patients' experiences and characteristics of the patients, GPs and the GP practices

	GP was polite	GP listened carefully	GP hardly looked at me when we talked	GP asked questions about my health problem	I couldn't really understand what the GP was trying to explain	GP took sufficient time	After the visit, I can cope better with my health problem
	OR (95 % CI)	OR (95 % CI)	OR (95 % CI)	OR (95 % CI)	OR (95 % CI)	OR (95 % CI)	OR (95 % CI)
Patient's gender							
Male (ref)							
Female	0.5 (0.2–1.4)	1.0 (0.5–2.2)	1.0 (0.7–1.6)	1.0 (0.7–1.5)	1.2 (0.8–1.9)	0.7 (0.4–1.1)	1.0 (0.6–1.6)
Patient's age							
< 30	#	1.7 (0.5–6.3)	1.3 (0.7–2.3)	**2.3 (1.1–4.6)****	1.4 (0.8–2.4)	1.8 (1.0–3.5)	0.8 (0.5–1.5)
30–65 (ref)							
> 65	#	0.6 (0.3–1.2)	**1.7 (1.0–2.9)****	0.7 (0.4–1.1)	**2.0 (1.1–3.4)****	1.1 (0.6–2.1)	**4.7 (1.8–12.3)***
Regular doctor?							
No (ref)							
Yes	0.9 (0.2–3.8)	2.7 (1.0–6.9)	0.8 (0.4–1.6)	1.7 (0.9–3.0)	0.6 (0.4–1.2)	1.5 (0.8–2.9)	1.5 (0.7–3.1)
GP's gender							
Male (ref)							
Female	0.5 (0.2–1.5)	0.5 (0.3–1.1)	0.9 (0.6–1.4)	0.8 (0.5–1.2)	1.1 (0.8–1.7)	0.8 (0.5–1.3)	0.9 (0.6–1.6)
GP's age							
≤ 35	1.2 (0.3–5.6)	2.9 (0.7–11.4)	1.2 (0.6–2.2)	1.1 (0.6–2.0)	1.4 (0.8–2.4)	1.0 (0.6–1.8)	1.1 (0.6–2.0)
36–59 (ref)							
≥ 60	0.6 (0.1–2.2)	1.1 (0.4–3.6)	0.7 (0.2–2.1)	**0.5 (0.3–0.8)***	0.4 (0.2–1.2)	1.1 (0.6–2.1)	1.4 (0.6–3.3)
Geographical location							
Urban (ref)							
Rural	0.9 (0.3–2.4)	0.6 (0.3–1.3)	1.6 (1.0–2.5)	0.8 (0.5–1.3)	**1.8 (1.2–3.0)****	0.9 (0.5–1.4)	0.9 (0.5–1.7)
Size of patient list							
> 1300	0.9 (0.2–4.2)	1.5 (0.5–4.4)	**1.8 (1.0–3.0)****	1.0 (0.6–1.7)	1.4 (0.7–2.5)	0.7 (0.4–1.3)	**0.5 (0.3–0.9)****
900–1300 (ref)							
< 900	**0.2 (0.1–0.7)***	1.3 (0.5–3.4)	1.2 (0.7–2.1)	**0.6 (0.4–1.0)****	1.0 (0.6–1.6)	**0.5 (0.3–0.9)****	0.7 (0.3–1.4)
Employment							
Fixed salary (ref)							
Fee for service	0.4 (0.0–3.5)	0.7 (0.1–4.1)	2.7 (0.9–7.9)	0.8 (0.3–1.9)	1.1 (0.5–2.4)	0.6 (0.2–1.5)	1.1 (0.4–3.4)
Average duration of consultation							
≤ 17 min, ref							
> 18 min	1.2 (0.3–4.2)	0.8 (0.3–2.4)	1.0 (0.7–1.7)	1.1 (0.7–1.6)	1.0 (0.6–1.7)	1.5 (0.9–2.5)	1.1 (0.6–1.8)

*$p < 0.005$, **$p < 0.05$, # Too few respondents in one of the categories, ref = reference group

The table shows the results of multivariate cluster analyses (generalized estimating equations). For the dependent variables in the top row, odds ratio indicates the probability of the answer yes. The left column indicates subgroups of patients according to characteristics of the patients or of the GP they attended. Bold figures indicate statistically significant associations

additional questions. The oldest patients were more likely to feel that they could cope better after the visit to the GP than the youngest patients (OR 5.7; CI 1.9–16.5). The oldest age group was more likely to answer yes to the statement "I couldn't really understand what the doctor was trying to explain" (OR 2.0; CI 1.1–3.4) compared to the middle age group, but no difference was found when compared to the youngest age group.

We found no associations between the patients' experiences and the GPs' form of employment, the average duration of consultation estimated by the GPs or whether the GP was the patient's regular doctor or not.

Discussion

The patients in our material reported an overall positive experience with their GP consultations. The patients' experiences were to a certain extent influenced by the size of the GP's patient list, the geographical location of the practice and the GP's age. Among these effects, the list size stands out as the most influential, and both short and long patient lists were associated with a more negative patient experience. We also found that the patients' age was of significance as to how they perceived their visit to the GP. The older patients were more likely to experience that the doctor did not look at them while talking, and they found it more difficult to understand what the GP tried to explain. Nevertheless, they were also more likely to feel that they could cope better with their health problems after the visit to the GP.

Interpretation of results and comparisons with previous studies

We found an association between the size of the GPs patient lists and the patients' experiences. Intuitively, and based on previous reports [18–20], one might expect that GPs with shorter patient lists will have more time per patient, rendering the patient with an experience of a doctor that takes enough time and makes sure to ask supplementary questions to the patient's story [19]. This was not found in our study. Patients who saw GPs with shorter patient lists reported relatively more negative experiences with regard to time spent, the doctor's politeness and whether the GP asked for more information. Shorter patient lists may be due to less time in the practice, lower work capacity for the individual doctor, or not having achieved the warranted number of patients on the list. The last situation may occur when the practice is newly established or because the doctor simply is not popular among patients. Less time present in the practice may be due to additional employments. Private reasons such as having young children or personal illness may be reasons for reduced capacity of the individual doctor. We did not have data to further explore these different reasons for the associations found.

On the other hand, patients who attended GPs with the largest patient lists were more likely to report that the doctor hardly looked at them while talking and less likely to feel that they could cope better with their health problems after the visit to the GP. It is possible that the busy doctors with the largest patient lists devote less time to making sure that their intended message has been received by the patients, and with a higher patient turnover there may be less awareness towards the patients' need to ask clarifying questions.

A Dutch study concluded that the optimum practice size with regard to the physicians' workload was found in the largest practices, but they did not investigate the effects on patients' experiences [21]. In a recent Swiss study, a higher satisfaction rate was found in smaller practices measured by the number of GPs working in the practice, but the study did not explore the effect of the number of patients in each practice [22]. Studies on practice size are not always directly comparable between countries, as systems differ with regard to how the patient population of the individual GP is defined. A possible interpretation of our findings with regard to the size of patient lists is that, from the patients' point of view, a GP should have a list of a certain size to ensure satisfactory service, but that there seems to be an upper limit for the list size to allow for adequate patient care. Further research concerning GPs' reasons for having short and long patient lists will be of interest to contribute to the understanding of our findings.

Patients who consulted a GP in a rural setting were more likely to report that they had problems understanding what the GP was trying to explain. This could be due to language problems, as GPs with an immigrant background more often than other GPs work in rural areas of Norway [23].

A recent paper based on the international results from the QUALICOPC study investigated the patients' evaluation of the importance of different aspects of the contact with the GP [24]. The Norwegian patients valued involvement and communication highly, underlining the importance of identifying factors that may affect the patients' experiences in these areas. Overall, we did not find that organizational factors had a large impact on how patients experienced their visit to the GP when focusing on the communicative interaction between doctor and patient. A possible reason for this is that Norwegian inhabitants may freely choose their regular GP provided that there is sufficient availability of GPs in the relevant geographical region. It is probable that people choose a doctor whose communicative style fits their own preferences. Patients should not be seen as a homogenous group that all expect and prefer the same qualities in a doctor. The diversity of Norwegian GPs may therefore be regarded as a positive quality that gives

the inhabitants the possibility of choosing a personal doctor who provides services in a manner preferable to the individual.

Strengths and limitations

The recruitment procedure for the participating GPs was suboptimal in terms of obtaining a random selection. The GP population in the study is a convenience sample recruited through formal and informal networks of the four participating research units, and is therefore not necessarily a fully representative sample of Norwegian GPs. However, the GPs were recruited from various geographical regions throughout the country. Some of the GPs have university affiliations and may therefore be more positive than most GPs towards participations in research projects. In 2013, 38.6 % of Norwegian GPs were female [12], in our material 29.1 % of the GPs were female. The average age of Norwegian GPs in 2013 was 48.1 years, whereas the GPs in our material were slightly younger with a mean of 45.7 years. The mean patient list size per GP in Norway in 2013 was 1150 patients [12], whereas in our material it was somewhat smaller with a difference of 57 patients. In 2013, 4.7 % of the Norwegian GPs were on regular salaries [12], compared to 8.6 % in our material. GPs on regular salaries might be more likely to take part in research projects during their regular work hours, as this will not affect their income. The differences are small, and we therefore assume that our material is representative of the Norwegian GP population.

As our data origins from a larger, international study, it was not possible to fully customize the questions to Norwegian conditions or to the specific needs of the present national study. Information about how many days per week the GPs work in their practices and more detailed information about the geographical location would have been of value to our study.

The strength of our study lies in the size of the material and the possibility to link information from the patients with detailed information from the actual GP they attended. The data were obtained from all over the country and are representative of the Norwegian GP population. The patients answered the questions in the GPs' waiting room, thus minimizing the potential for recall bias. Since the organisation of Norwegian general practice is rather diverse, we believe that our findings are of relevance even when evaluating primary care systems in other countries.

Conclusion

Norwegian patients report predominantly positive experiences when visiting a general practitioner.

Both short and long patient lists were associated with various negative patient experiences in the consultation with the GP. A rural location of the GP practice was negatively associated with the communicative experience of the patients.

Our study suggests that from the patients' point of view, it is preferable for GPs to have a medium size patient list to allow for a positive communicative experience in the consultation.

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Availability of data and material

The raw data used in this study is the property of the international QUALICOPC consortium. The data is available upon reasonable request.

Authors' contributions

TBE was one of two Norwegian national coordinators for QUALICOPC and was responsible for some of the data collection in Norway. HM was the main national coordinator for QUALICOPC. GR, IH and JS were involved in the planning and implementation of QUALICOPC Norway. TBE, JS and EOR planned the design of this QUALICOPC sub-study. TBE performed all statistical analyses, drafted the manuscript and prepared all tables. All authors reviewed and revised the manuscript. All authors read and approved the final manuscript.

Competing interests

The authors declare that they have no competing interests.

Consent for publication

Not applicable.

Ethics approval and consent to participate

The Regional Committee for Medical and Health Research Ethics in South-Eastern Norway concluded that their approval was not required for this study, as no identifiable data were collected. Verbal consent was obtained from participating patients and GPs. No medical interventions were carried out and no identifiable data were collected, so written consent was not considered necessary.

Author details

[1]Department of General Practice, Institute for Health and Society, University of Oslo, Oslo, Norway. [2]General Practice Research Unit, UiT The Arctic University of Norway, Tromsø, Norway. [3]Research Unit for General Practice, Uni Research Health, Bergen, Norway. [4]Department of Global Public Health and Primary Care, University of Bergen, Bergen, Norway. [5]General Practice Research Unit, Department of Public Health and General Practice, Norwegian University of Science and Technology, Trondheim, Norway.

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III

BJGP Open

RESEARCH

Patients' and GPs' expectations regarding healthcare-seeking behaviour: a Norwegian comparative study

Torunn Bjerve Eide, MD[1]*, Jørund Straand, MD, PhD[2,3], Elin Olaug Rosvold, MD, PhD[4]

[1]PhD Student, Department of General Practice, Institute of Health and Society, University of Oslo, Oslo, Norway; [2]Leader, Department of General Practice, General Practice Research Unit (AFE), Institute of Health and Society, University of Oslo, Oslo, Norway; [3]Professor, Department Leader, Department of General Practice, Institute of Health and Society, University of Oslo, Oslo, Norway; [4]Professor, Leader of the National Research School in General Practice, Department of General Practice, Institute of Health and Society, University of Oslo, Oslo, Norway

Abstract

Background: GPs are Norwegian patients' first contact point with the healthcare system for most medical problems. However, little is known regarding GPs' expectations towards their patients' healthcare-seeking behaviour, or whether doctors and patients have coinciding expectations of what GPs can do for their patients.

Aim: To investigate patients' and GPs' expectations regarding patients' healthcare-seeking behaviour in primary care, and to make comparisons between the two.

Design & setting: Norwegian data from the Quality and Costs of Primary Care in Europe (QUALICOPC) questionnaire study, with information from GPs and their patients.

Method: Binary logistic regression was used to investigate associations between expectations, sex and age of GPs and patients, list size, and geographical location of practice. Results are presented as odds ratios (ORs) with 95% confidence intervals (CIs). Expectation differences between GPs and patients were analysed using generalised estimating equations (GEEs). Due to multiple testing, Bonferroni correction was used to define significance level at $P \leq 0.002$.

Results: In total, 198 GPs (39.1% female) and 1529 patients (61.9% female) responded. No associations with sex or age were found for the GPs' expectations regarding patients' healthcare-seeking behaviour. Among patients, fewer males than females expected that most people would see their GP for sprained ankle (OR 0.7, 95% CI = 0.5 to 0.9), finger cut (OR 0.6, 95% CI = 0.4 to 0.7), smoking cessation (OR 0.6, 95% CI = 0.5 to 0.8), or anxiety (OR 0.4, 95% CI = 0.3 to 0.6). Older patients (aged >65 years) found it more important than younger patients to see a doctor in the presence of medical symptoms. GPs had higher expectations than their patients that people in general would see them for deteriorated vision (OR 4.2, 95% CI = 2.5 to 6.9), sexual problems (OR 1.8, 95% CI =1.3 to 2.6), and anxiety (OR 3.0, 95% CI =1.5 to 6.0).

Conclusion: For several common health problems, males are less likely than females to believe that people will see their GP. GPs may overestimate to what degree their patients will see them for a number of common medical problems.

***For correspondence:** torunnbjerveeide@gmail.com

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How this fits in

Norway has a strong primary health care system, and GPs offer comprehensive medical services to their patients. However, little is known about whether GPs and their patients have similar expectations regarding which medical issues that will bring people to see their GP. This study found that GPs may overestimate to what degree their patients will see them for common medical problems, in particular for psychosocial issues. Patients' sex and age affect their healthcare-seeking behaviour.

Background

Healthcare systems with a strong primary care sector are associated with better population health,[1] lower rates of avoidable hospitalisation[1] and a better patient perception of primary care quality.[2] Health systems with strong primary care have better cost effectiveness and slower growth in health expenditures.[3]

In 2001, Norway introduced the regular general practitioner (RGP) scheme, assigning every inhabitant to an individual GP. In 2016, 70% of Norwegians had one or more visits to their RGP, with a mean of 2.6 visits per inhabitant.[4] GPs are patients' first contact point with the health services for most medical problems, and offer a comprehensive range of services.[5,6] GPs also have a gatekeeping role for access to specialised healthcare services. Most citizens therefore have some knowledge about their RGP and the medical services they offer.

With this in mind, it is of interest to know what kind of medical help patients expect to receive in general practice, and whether doctors and patients have coinciding expectations of what GPs can do for their patients. Extensive research exists on what kind of symptoms and complaints bring people to the GP.[4,6–12] While most studies focus on the symptoms and medical issues addressed in the consultation, less is known regarding patients' preconceived beliefs about what kind of medical problems a GP can help with.[13,14] Most people have a notion regarding which conditions they can safely handle themselves; thus, most minor complaints will not lead to a visit to their GP.[15] When someone consults a GP, they probably have an expectation that this will somehow help or benefit them. However, information is lacking about such expectations. Patients' experiences with the healthcare system may also influence their propensity to seek health care. In a multinational European study, it was found that patients who reported good access and continuity, as well as good communication with their GP, had a higher propensity to seek care, especially for minor complaints.[16] Among 23 GPs and their patients in Switzerland, Sebo *et al* found that GPs tend to underestimate patients' satisfaction while overestimating their expectations regarding structural aspects, such as access to care and presence of laboratory equipment, but the authors did not investigate expectations towards clinical problems.[17] It is likely that GPs have expectations concerning which complaints and symptoms bring their patients to them. However, the present authors did not find studies on this issue, nor on whether or not GPs' and their patients' expectations coincide.

This study from Norwegian general practice aims to investigate patients' and GPs' expectations concerning patients' healthcare-seeking behaviour, and whether they are associated with GPs' or patients' sex or age, GP list size, or geographical location of the practices. Comparisons will be made between the patients' healthcare-seeking behaviour and the GPs' expectations.

Method

This study uses data originating from the QUALICOPC study.[18] A set of questionnaires for GPs and patients was developed by the QUALICOPC Partner Consortium, led by the Netherlands Institute for Health Services Research (NIVEL). Across Europe, participating GPs completed a questionnaire reporting information about their practices. Questionnaires were distributed to patients in GP waiting rooms on one day (randomly selected), and all participating patients had an appointment with the GP that same day; some questions related to that specific visit, and some were more general (see ***Box 1*** for the phrasing of questions used in this study).

The questionnaires were derived from existing, validated questionnaires in three consensus rounds followed by a pilot study before a final revision. Translation to Norwegian was done using a 'forth and back' translation procedure, as described by Schafer et al.[19] The questionnaires are described in further detail elsewhere,[19] as is the implementation of the QUALICOPC study.[18]

Box 1. Items included in the analysis from GP questionnaires and patient questionnaires. Questions from the Quality and Costs of Primary Care in Europe (QUALICOPC) study, 2012–2013

Questions from the GP questionnaire	
In case of the following health problems, to what extent will patients in your practice population contact you as the first doctor?[a] (Only first contact, not for further diagnosis or treatment) Possible answers: (Almost) always, Usually, Occasionally, Seldom/Never	
Somatic problems	Child with severe cough[b]
	Man aged 24 with stomach pain[b]
	Woman aged 60 with deteriorating vision[b]
	Man aged 35 with sprained ankle[b]
	Woman aged 60 with polyuria
	Woman aged 60 with acute symptoms of paralysis/paresis
	Man aged 70 with joint pains
	Woman aged 75 with moderate memory problems
	Child aged 8 with hearing problem
	Man aged 28 with a first convulsion
	Man aged 45 with chest pain
	Woman aged 50 with a lump in her breast
	Woman aged 18 asking for oral contraception
Psychosocial problems	Man aged 32 with sexual problems[b]
	Physically abused child aged 13
	Anxious man aged 45[b]
	Couple with relationship problems[b]
	Woman aged 50 with psychosocial problems
	Man aged 52 with alcohol addiction problems
Questions from the patient questionnaire	
Would most patients visit their GP for the following conditions? Possible answers: Yes, Probably yes, Probably not, No, Don't know	
Somatic problems	Child with severe cough[b]
	Stomach pain[b]
	Deteriorated vision[b]
	Sprained ankle[b]
	Cut finger that needs to be stitched
	Removal of a wart
	Blood in stool
	Help to quit smoking
Psychosocial problems	Sexual problems[b]
	Domestic violence
	Anxiety[b]
	Relationship problems[b]
Other	Routine health cheques
	Advice for choosing the best hospital/specialist
How important would it be for you to see a doctor if you had... Possible answers: Extremely important, Rather important, Somewhat important, Not important	

continued on next page

Somatic problems		Weight loss >2 kg in one month
		Shortness of breath with light exercise
		Chest pain when exercising
		Headache >1 day
		Abdominal pains >1 day
		Loss of consciousness/fainting
Psychosocial		Severe worries >1 month
Do you expect to benefit from a visit to your GP for... Possible answers: Yes, No, Don't know		
Somatic problems		Stomach problems
		Diarrhoea
		Shoulder/neck pain
		Headache
		Flu
		Sore throat
		Feeling nauseous
		Feeling tired
Psychosocial		Feeling nervous
Do you agree with the following statements? Possible answers: Strongly agree, Agree, Disagree, Strongly disagree		
		In general, doctors can be trusted
		In general, people can be trusted

[a]In the English version of the questionnaire, the term 'first healthcare provider' was used, but in the Norwegian version this was translated to 'first doctor'.
[b]Included in regression analysis to compare responses from GPs and patients.

Sample

GPs in Norway were recruited through convenience sampling within formal and informal GP networks. Patients aged ≥18 years were approached by a field worker in the GP's waiting room before a consultation to request participation. The patient questionnaire was answered partly before and partly after the consultation. All questionnaires were answered anonymously. A unique identification number linked GP responses to the responses of their patients. Data collection took place from November 2012–April 2013.

Main outcome measures

Box 1 shows all dependent variables from the GP and patient questionnaires that were included in the analysis. The GPs were asked to what extent they believed that their patients would contact them given a selection of health problems or symptoms. For each problem or symptom, the GPs were given four possible answers: (Almost) always (1); Usually (2); Occasionally (3); and Seldom/never (4). During analysis, answers were dichotomised: (1 + 2) and (3 + 4).

The patients were asked whether they believed that most patients would see their GP for a predefined selection of health problems, with five possible answers: Yes (1); Probably yes (2); Probably no (3); No (4); and Do not know (recorded as 'missing'). During analysis, answers were dichotomised to either Yes (1 + 2) or No (3 + 4). Patients were also asked if they expected to benefit from visiting their GP for the listed health problems, with the response alternatives Yes; No; and Do not know (recoded as 'missing'). Finally, the patients were asked how important it would be for them to see a doctor when experiencing the listed symptoms, with four possible answers: Extremely important (1); Rather important (2); Somewhat important (3); Not important (4). During analysis, they were merged into Important (1 + 2) or Not important (3 + 4).

For the participating GPs, sex, age, size of patient list, and urban or rural practice setting were recorded. For participating patients, sex and age were recorded.

Statistics

A binary logistic regression model was used to analyse patients' and GPs' responses by their sex, age, and practice location, and, for GPs, by their patient list size.

To explore possible differences in patients' and doctors' expectations, seven comparable items were identified from the GP and patient questionnaires (***Box 1***). Due to the clustered structure of the material, with patients nested within GPs, a GEE logistic regression model was used, correcting for patients' and GPs' sex and age, and also practice location and the size of patient list of the GP that the patient had visited.

To correct for multiple testing, a Bonferroni correction was conducted based on the maximum number of tests[19] for one questionnaire item. After calculating $\alpha = 0.05/19 = 0026$, significance level was set at $P \leq 0.002$. Results with $P<0.05$ are also highlighted in the tables. ORs and percentages are given with 95% CIs. Analyses were performed in IBM SPSS Statistics (version 22).

Results

Characteristics of the participating 198 GPs (39.1% female) and 1529 patients (61.9% female) are presented in ***Table 1***.

Table 2 shows the GPs' answers to which health problems they believe would bring their patients to see them. Almost all GPs believed that patients would see them for common health problems such as severe cough, stomach pain, lump in breast, polyuria, joint pain, or anxiety. They less frequently expected patients to consult for convulsions, abuse, relationship problems, or alcohol problems. There were no significant ($P \leq 0.002$) associations with sex, age, list size, or location of practice, apart from lower expectation among urban GPs to be visited for a convulsion episode.

Table 3 summarises the patients' answers to three different questions concerning healthcare-seeking behaviour. Almost all patients believed that most people would see their GP for common

Table 1 Demographics of patients (n = 1529) and GPs (n = 198) participating in the Norwegian part of the Quality and Costs of Primary Care in Europe (QUALICOPC) study, 2012–2013.

	Total *n* (%)	Female *n* (%)	Male *n* (%)
Patients			
Total	1529 (100.0)	916 (61.9)[a]	564 (38.1)[a]
Age[b]			
Range	18–93	18–91	18–93
Mean	48.7	46.2	52.5
GPs			
Total	198 (100.0)	77 (39.1)[c]	120 (60.9)[c]
Age			
Range	28–69	28–68	28–69
Mean	45.7	43.4	47.0
Practice location[d]			
Large inner city	66 (33.8)	29 (38.7)	36 (30.3)
Suburbs	27 (13.8)	12 (16.0)	15 (12.6)
Small town	44 (22.6)	14 (18.7)	30 (25.2)
Mixed urban–rural	31 (15.9)	7 (9.3)	24 (20.2)
Rural	27 (13.8)	13 (17.3)	14 (11.8)
Size of patient list[c]			
Range	250–1800	400–1500	250–1800
Mean	1093.4	1048.9	1122.6

[a]Missing data = 49. [b]Missing data = 59. [c]Missing data = 1. [d]Missing data = 3.

Table 2. 'In case of the following health problems, to what extent will patients in your practice population contact you as the first doctor?' Responses from GPs (*n* = 198) who participated in the Norwegian part of the Quality and Costs of Primary Care in Europe (QUALICOPC) study, 2012– 2013. Results given as valid percentages and ORs with 95% CIs, indicating the probability for the answer Always/Usually, with Occasionally/Never as reference by sex, age, list size, and practice location

Patient cases(age, years)	*n*[a]	% (95% CI)	GP sex (reference: female)	GP age (reference: 36–59)		List size (reference: 901–1300)		Location of practice (reference: rural)
			Male	≤35	≥60	≤900	>1300	Urban
Child severe cough[b]	194	98.5 (96.4 to 100.0)	—[i]	—[i]	0.1 (0.0 to 0.8)[j]	0.3 (0.0 to 5.4)	0.5 (0.0 to 12.1)	0.8 (0.1 to 14.9)
Man (24) Stomach pain[c]	189	96.9 (94.4 to 99.0)	0.9 (0.1 to 5.1)	—[i]	0.7 (0.1 to 7.0)	0.8 (0.1 to 5.6)	1.2 (0.1 to 13.2)	2.2 (0.4 to 13.2)
Woman (60) Deteriorated vision[c]	175	89.7 (85.6 to 93.8)	1.5 (0.6 to 3.9)	1.1 (0.3 to 4.1)	0.9 (0.2 to 4.6)	0.9 (0.3 to 3.1)	0.6 (0.2 to 1.9)	0.9 (0.3 to 2.8)
Man (35) Sprained ankle[d]	146	75.3 (69.1 to 81.4)	0.9 (0.4 to 1.7)	0.8 (0.3 to 2.0)	1.1 (0.3 to 3.6)	0.6 (0.3 to 1.5)	0.9 (0.4 to 2.1)	0.3 (0.1 to 0.9)[j]
Woman (60) Polyuria[c]	187	95.9 (92.8 to 98.5)	0.9 (0.2 to 4.2)	0.5 (0.1 to 3.1)	0.6 (0.1 to 5.8)	0.9 (0.1 to 5.7)	1.1 (0.2 to 6.3)	0.3 (0.0 to 2.9)
Woman (60) Acute paresis[c]	138	70.8 (64.1 to 76.9)	0.7 (0.3 to 1.3)	1.2 (0.5 to 3.2)	0.9 (0.3 to 2.7)	1.8 (0.8 to 4.4)	2.9 (1.2 to 7.0)[j]	0.2 (0.1 to 0.5)[k]
Man (70) Joint pain[e]	188	97.4 (94.8 to 99.5)	0.5 (0.1 to 5.1)	0.7 (0.1 to 7.4)	0.4 (0.0 to 4.0)	0.3 (0.0 to 3.9)	0.2 (0.0 to 2.6)	1.8 (0.2 to 16.1)
Woman (75) Memory problems[d]	180	92.8 (88.7 to 96.4)	0.7 (0.2 to 2.4)	0.3 (0.1 to 1.3)	0.3 (0.1 to 1.3)	1.0 (0.3 to 4.1)	1.1 (0.3 to 5.0)	0.8 (0.2 to 3.2)
Child (8) Hearing problems[f]	172	87.8 (82.7 to 92.3)	1.3 (0.5 to 3.4)	1.0 (0.3 to 3.4)	0.4 (0.1 to 1.5)	0.5 (0.2 to 1.4)	0.9 (0.3 to 3.2)	1.9 (0.7 to 5.9)
Man (28) First convulsions[g]	107	55.7 (49.0 to 63.0)	0.4 (0.2 to 0.8)[j]	1.0 (0.4 to 2.3)	2.3 (0.8 to 6.8)	2.3 (1.0 to 5.1)[j]	1.6 (0.7 to 3.5)	0.4 (0.2 to 0.8)[j]
Man (24) Chest pain[c]	172	88.2 (83.6 to 92.8)	0.5 (0.2 to 1.4)	4.2 (0.5 to 33.2)	1.0 (0.3 to 3.8)	2.2 (0.6 to 8.5)	1.0 (0.4 to 2.9)	0.7 (0.2 to 2.3)
Woman (50) Breast lump[c]	192	98.5 (96.4 to 100)	0.7 (0.1 to 9.0)	—[i]	—[i]	0.3 (0.0 to 4.5)	—[i]	2.6 (0.2 to 35.0)
Woman (18) Contraception[f]	169	86.2 (81.1 to 90.8)	0.3 (0.1 to 0.9)[j]	1.2 (0.3 to 4.7)	1.8 (0.4 to 7.5)	10.7 (2.1 to 54.0)[j]	0.8 (0.3 to 2.3)	4.5 (1.6 to 12.3)[j]
Man (32) Sexual problems[d]	142	73.2 (66.0 to 79.4)	1.4 (0.7 to 2.8)	2.5 (0.8 to 7.9)	0.6 (0.2 to 1.8)	1.1 (0.5 to 2.6)	1.4 (0.6 to 3.5)	1.3 (0.6 to 2.7)
Child (13) Physical abuse[h]	73	38.6 (31.7 to 46.0)	0.7 (0.4 to 1.4)	0.9 (0.4 to 2.2)	1.6 (0.6 to 4.2)	1.4 (0.7 to 3.0)	1.5 (0.7 to 3.3)	0.6 (0.3 to 1.2)
Man (45) Anxiety[e]	183	94.8 (91.7 to 97.4)	1.2 (0.3 to 4.6)	0.7 (0.1 to 3.9)	0.9 (0.1 to 8.1)	0.8 (0.2 to 4.0)	0.5 (0.1 to 2.7)	1.1 (0.2 to 5.1)
Relationship problems[g]	77	40.1 (32.8 to 47.4)	0.7 (0.4 to 1.4)	0.8 (0.4 to 2.0)	0.8 (0.3 to 2.3)	1.2 (0.6 to 2.6)	1.4 (0.6 to 3.0)	0.6 (0.3 to 1.2)
Woman (50) Psychosocial problems[e]	182	94.3 (90.7 to 97.4)	0.3 (0.1 to 1.6)	—[i]	0.2 (0.1 to 0.9)[j]	1.4 (0.3 to 7.9)	5.7 (0.6 to 51.1)	0.5 (0.12.5)
Man (52) Alcohol problems[c]	117	60.0 (53.8 to 66.7)	1.1 (0.6 to 2.0)	1.6 (0.7 to 3.8)	0.5 (0.2 to 1.3)	1.1 (0.5 to 2.4)	1.6 (0.73.6)	1.1 (0.52.2)

[a]GPs who answered always or usually. [b]Missing data = 1. [c]Missing data = 3. [d]Missing data = 4. [e]Missing data = 5. [f]Missing data = 2. [g]Missing data = 6. [h]Missing data = 9. [i]System missing due to overflow. [j]$P<0.05$. [k]Statistically significant ($P\leq0.002$).

somatic conditions, such as stomach pain, blood in stools, or children with cough, whereas there was more variation in the patients' answers regarding psychosocial problems such as relationship problems (31.9%) and anxiety (84.5%). Fewer male than female patients expected that patients would seek their GP for anxiety, a cut in need of stiches, help to quit smoking, or sprained ankle. However, more males than females thought it important to see their GP for headache. Compared with responders aged 30–65 years old, younger patients less often believed that patients would see their GP for anxiety or a cut in need of stitches. The oldest group of patients (aged >65 years) were more likely to believe that patients would consult their GP for a sprained ankle or relationship problems. Younger patients found it less important than older patients to see a doctor for several symptoms of possible serious disease. Older patients (aged >65 years) expected to benefit more than the younger patients from a GP visit for stomach problems or nervousness. Almost all patients felt that doctors in general can be trusted.

For seven health problems or symptoms, there was comparable information from both patients and GPs (***Box 1***). For all seven items, the GPs were more likely than the patients to believe that people would seek them for the given complaints (***Figure 1***). In regression analyses, adjusting for the clustered nature of the material and correcting for GPs' and patients' age and sex, size of patient lists, and geographical location of practice, this difference was significant ($P \leq 0.002$) for three of the seven items: deteriorated vision (OR 4.2, 95% CI = 2.5 to 6.9), anxiety (OR 3.0, 95% CI = 1.5 to 6.0), and sexual problems (OR 1.8, 95% CI = 1.3 to 2.6), as shown in ***Table 4***.

Discussion

Summary

Norwegian GPs seem to overestimate how often patients would visit them for common health problems. This applies in particular for psychosocial problems.

Male patients were less prone to believe that most people will visit a GP for some common conditions. Older patients found it more important than younger and middle-aged patients to see a doctor, and had higher expectations of benefitting from a GP visit.

Strengths and weaknesses

To the authors' knowledge, existing research on patient expectations has not investigated differences between GPs' and patients' expectations regarding which problems patients will seek their GP for.[7,9] This study therefore provides new knowledge within the field of patient–doctor interaction. This study allows linking of information from patients with information from their GPs. Using a GEE logistic regression model, the authors have adjusted for the patient expectations stemming from variation at the GP-level. GPs and patients were recruited from the whole country, and their age and sex distributions are comparable to the Norwegian averages.[20,21]

Patients were recruited in the GPs' waiting room, meaning that only patients who had already decided to see a GP were included. Thus, persons with low expectations to benefit from a GP visit were less likely to be included in the study. This may have caused an underestimation of the differences in expectation.

The questionnaires were originally designed for a large international study, and were, among other things, designed to compare the results with a previous study.[22,23] The phrasing of the questions is slightly different in the GP questionnaire than in the patient questionnaire (***Box 1***), and this may theoretically have caused an overestimation of the differences. Furthermore, the selection of health problems were decided by the international QUALICOPC consortium and have not been adapted to a Norwegian setting specifically.

Comparison with existing literature

Literature concerning medical services offered by GPs often focuses on the content of the consultation.[24–28] However, patients' thoughts about what kind of problems their GP can assist with are less well described. This study adds new knowledge to this field. Some of the findings seem surprising: <40% of the patients considered it very important to see a doctor if they involuntarily lose 2 kilograms in a month, although unintended weight loss is considered an alarm symptom for possible malignant disease.[29,30] Only 60% of the patients believed that most patients would see a GP for

Table 3. Patients' views on anticipated healthcare-seeking behaviour. Responses from patients (*N* = 1529, *n* = valid responses) participating in the Norwegian part of the QUALICOPC study, 2012–2013. Results given as valid percentages and ORs with 95% CIs by sex, age, and location

1. Would most patients see their GP for the following conditions?[ab]						
			Sex (reference: female)	Age groups (reference: 30–65 years)		Geographical location (reference: rural)
Condition (valid response, *n*)	Yes, *n*	% (95% CI)	Male OR (95% CI)	Age <30 OR (95% CI)	Age >65 OR (95% CI)	Urban OR (95% CI)
Child with severe cough (1372)	1295	94.4 (93.1 to 95.5)	0.6 (0.3 to 0.9)[g]	1.1 (0.5 to 2.3)	0.9 (0.5 to 1.8)	1.3 (0.7 to 2.2
Stomach pain (1411)	1307	92.6 (91.2 to 93.9)	0.8 (0.5 to 1.2)	0.7 (0.4 to 1.2)	1.2 (0.7 to 2.1)	1.1 (0.7 to 1.7)
Deteriorated vision (1356)	927	68.4 (65.9 to 70.8)	1.1 (0.8 to 1.4)	0.8 (0.6 to 1.1)	1.5 (1.1 to 2.1)[g]	0.7 (0.5 to 0.9)[g]
Sprained ankle (1364)	992	67.6 (65.1 to 70.0)	0.7 (0.5 to 0.9)[f]	0.8 (0.6 to 1.2)	1.9 (1.3 to 2.6)[f]	0.8 (0.6 to 1.0)
Cut finger, needing stitches (1391)	1015	73.0 (70.6 to 75.3)	0.6 (0.4 to 0.7)[f]	0.6 (0.4 to 0.8)[f]	1.6 (1.1 to 2.4)[g]	0.6 (0.4 to 0.8)[f]
Wart removal (1324)	1083	81.8 (79.7 to 83.8)	0.7 (0.5 to 1.0)[g]	0.8 (0.5 to 1.2)	0.9 (0.6 to 1.4)	1.2 (0.9 to 1.7)
Blood in stool (1418)	1378	97.2 (96.2 to 98.0)	0.5 (0.3 to 1.0)[g]	0.5 (0.2 to 1.0)[g]	1.5 (0.5 to 3.9)	0.7 (0.3 to 1.6)
Help to quit smoking (1118)	676	60.5 (57.6 to 63.3)	0.6 (0.5 to 0.8)[f]	0.9 (0.6 to 1.2)	0.9 (0.6 to 1.2)	1.0 (0.7 to 1.3)
Sexual problems (1107)	680	61.4 (58.5 to 64.3)	1.3 (1.0 to 1.7)	1.0 (0.7 to 1.4)	0.8 (0.6 to 1.1)	1.0 (0.8 to 1.4)
Domestic violence (1034)	603	58.3 (55.3 to 61.3)	0.9 (0.7 to 1.2)	0.7 (0.5 to 1.0)[g]	1.7 (1.2 to 2.4)[g]	1.0 (0.7 to 1.3)
Anxiety (1284)	1085	84.5 (82.5 to 86.4)	0.4 (0.3 to 0.6)[f]	0.4 (0.3 to 0.6)[f]	1.0 (0.7 to 1.6)	1.0 (0.7 to 1.4)
Relationship problems (1061)	338	31.9 (29.1 to 34.7)	0.8 (0.6 to 1.1)	0.7 (0.5 to 1.1)	1.9 (1.3 to 2.6)[f]	1.0 (0.7 to 1.4)
Routine health cheque (1437)	1356	94.4 (93.1 to 95.5)	0.7 (0.4 to 1.2)	0.5 (0.3 to 0.9)[g]	1.6 (0.8 to 3.4)	1.0 (0.6 to 1.7)
Advice for choosing hospital or specialist (1235)	1061	85.9 (83.9 to 87.8)	1.2 (0.8 to 1.7)	0.6 (0.4 to 0.9)[g]	1.9 (1.1 to 3.2)[g]	0.9 (0.6 to 1.4)
2. How important would it be for you to see a doctor if you had…?[c]						
	Very important	%	Male OR (95% CI)	Age <30 OR (95% CI)	Age >65 OR (95% CI)	Urban OR (95% CI)
Weight loss >2 kg in one month (1431)	527	36.8 (34.4 to 39.3)	0.9 (0.7 to 1.2)	0.5 (0.4 to 0.7)[f]	2.3 (1.7 to 3.0)[f]	1.1 (0.8 to 1.4)
Shortness of breath (1429)	792	55.4 (52.8 to 58.0)	1.1 (0.9 to 1.4)	0.6 (0.4 to 0.8)[f]	1.8 (1.3 to 2.4)[f]	1.2 (0.9 to 1.5)
Chest pain when exercising (1424)	1136	79.8 (77.6 to 81.8)	1.0 (0.8 to 1.3)	0.5 (0.3 to 0.6)[f]	1.9 (1.3 to 2.9)[g]	1.0 (0.7 to 1.3)
Headache >1 day (1415)	635	44.9 (42.3 to 47.5)	1.5 (1.2 to 1.9)[f]	0.8 (0.6 to 1.2)	1.7 (1.3 to 2.2)[f]	1.0 (0.8 to 1.3)
Abdominal pains >1 day (1424)	746	52.4 (49.8 to 55.0)	1.3 (1.1 to 1.7)[g]	1.1 (0.8 to 1.5)	1.6 (1.2 to 2.1)[f]	0.9 (0.7 to 1.1)
Loss of consciousness/ fainting (1432)	1323	92.4 (90.9 to 93.7)	1.2 (0.8 to 1.8)	0.3 (0.2 to 0.5)[f]	1.4 (0.7 to 2.8)	0.8 (0.5 to 1.3)
Severe worries >1 month (1429)	991	69.3 (66.9 to 71.7)	1.2 (0.9 to 1.5)	1.2 (0.9 to 1.7)	0.8 (0.6 to 1.0)	1.1 (0.8 to 1.4)
3. Do you expect to benefit from a visit to your GP for...?[d]						

Table 3 continued on next page

	Yes	%	Male OR (95% CI)	Age <30 OR (95% CI)	Age >65 OR (95% CI)	Urban OR (95% CI)
Stomach problems (1319)	1189	90.1 (88.5 to 91.7)	1.0 (0.6 to 1.4)	0.7 (0.5 to 1.2)	3.5 (1.7 to 7.4)[f]	1.0 (0.6 to 1.5)
Diarrhoea (1296)	1022	78.9 (76.6 to 81.0)	1.0 (0.8 to 1.4)	0.6 (0.4 to 0.9)[g]	1.9 (1.2 to 2.9)[g]	1.4 (1.0 to 1.9)[g]
Shoulder/neck pain (1295)	1037	80.1 (77.8 to 82.2)	1.2 (0.9 to 1.6)	0.6 (0.4 to 0.9)[g]	1.5 (1.0 to 2.2)	0.8 (0.5 to 1.1)
Headache (1254)	862	68.7 (66.1 to 71.3)	0.8 (0.61.0)	1.0 (0.7 to 1.5)	1.0 (0.7 to 1.4)	1.2 (0.9 to 1.6)
Flu (1301)	857	65.9 (63.3 to 68.4)	0.8 (0.6 to 1.1)	1.1 (0.8 to 1.6)	1.3 (1.0 to 1.8)	1.1 (0.9 to 1.5)
Sore throat (1320)	867	65.7 (63.1 to 68.2)	0.8 (0.6 to 1.0)[g]	0.8 (0.6 to 1.1)	1.2 (0.9 to 1.7)	1.2 (1.0 to 1.6)
Feeling nauseous (1205)	732	60.7 (58.0 to 63.5)	0.8 (0.6 to 1.0)[g]	0.8 (0.6 to 1.2)	1.2 (0.9 to 1.6)	1.4 (1.1 to 1.9)[g]
Feeling tired (1168)	854	73.1 (70.5 to 75.6)	0.6 (0.4 to 0.8)[f]	0.6 (0.4 to 0.9)[g]	1.1 (0.7 to 1.6)	1.3 (1.0 to 1.8)
Feeling nervous (1062)	699	65.8 (62.9 to 68.6)	0.8 (0.6 to 1.0)	0.5 (0.3 to 0.7)[f]	2.0(1.3 to 3.0)[f]	1.0 (0.7 to 1.3)
4. Do you agree with the following statements?[e]						
	Agree	%	Male OR (95% CI)	Age <30 OR (95% CI)	Age >65 OR (95% CI)	Urban OR (95% CI)
In general, doctors can be trusted (1458)	1420	97.4 (96.5 to 98.1)	1.4 (0.73.1)	0.8 (0.4 to 2.0)	4.1 (0.9 to 17.3)	2.9 (1.4 to 5.7)[g]
In general, people can be trusted (1396)	1064	76.2 (73.9 to 78.4)	0.9 (0.7 to 1.1)	0.4 (0.3 to 0.6)[f]	1.1 (0.8 to 1.5)	1.2 (0.9 to 1.7)

[a]OR (95% CI), giving the probability of the answer 'Yes' (yes + probably yes); reference is 'No' (no + probably no). [b]'Don't know' recoded to missing. [c]OR gives the probability of 'Important' (extremely + rather important); reference is 'not important' (somewhat + not important). [d]OR gives the probability for 'Yes', reference is 'No'. [e]OR gives the probability of 'Agree' (strongly agree + agree), reference is 'Disagree' (disagree+ strongly disagree). [f]Statistical significance of $P \leq 0.002$. [g]$P<0.05$.
CI = confidence intervals. OR = odds ratio.

help to quit smoking. This is in contrast to both public awareness campaigns and extensive research documenting GPs' potentially important role in smoking cessation.[31] Further research with qualitative methodology may explore possible explanations for these observations.

Several associations were found between patients' sex or age, and their expectations. When asked whether most patients would see a GP for the selected diagnosis, there was a tendency that male patients less often answered Yes. This is in accordance with the established knowledge that women see their GP more often than men.[4,6,32]

The youngest patients were less likely than middle-aged patients to believe that most patients would see a GP for several of the listed conditions. This could be due to a generational change in self-management of health problems. Younger patients may also be more likely to seek help through new tools such as social media.

Older patients found it more important than younger patients to see a doctor in presence of medical symptoms. This result mirrors the 'pre-test probability' for significant disease that increases with age for a given symptom.

GPs seemed to overestimate to what degree their patients will consult them. With a significance level of $P \leq 0.002$, only three of the seven items reached significance, but P value was <0.05 for all items except one. The authors interpret this as a probable general tendency for GPs to overestimate their patients' expectations. The difference seen for deteriorating vision is most likely due to easily accessible optometrists in Norway, who can also refer to ophthalmologists if needed. As for anxiety and sexual problems, some people may not be aware that GPs can assist with this kind of problems. It is also possible that anticipated social stigma or embarrassment is a reason for lower patient expectations.

The patients may have considered the illness behaviour of the estimated 75% of the population that report any symptom or illness per month, while the GPs may have considered the smaller part

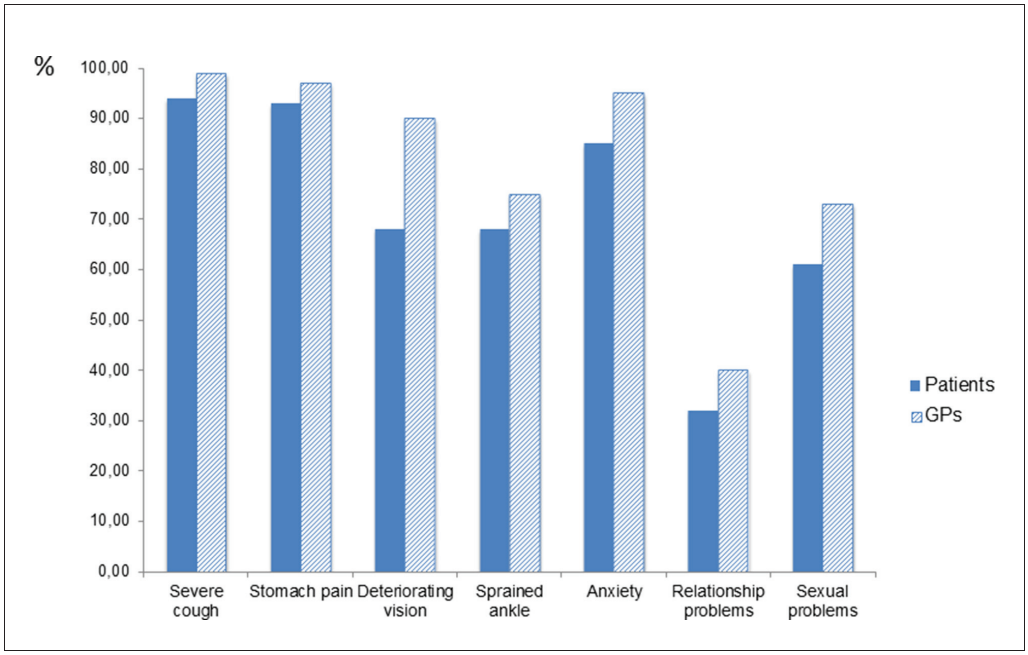

Figure 1 'Will people with the following complaints usually visit a GP?' The columns indicate the percentage of patients that answered 'yes' or 'probably yes', and GPs that answered 'almost always' or 'usually' (details in ***Tables 2*** and ***3***). For deteriorating vision, anxiety, and sexual problems, the differences were significant when analysed by multiple logistic regression, correcting for GPs' and patients' age and sex, location of GP practice, and GPs' list size (***Table 4***)

of the population that already have decided that they need professional help, as described by White.[15] The authors still believe that the observed difference may represent a real divergence in expectations between GPs and patients. For the non-somatic items, there were between 16–31% missing patient answers, possibly reflecting patients' uncertainty regarding whether their GP can offer help. Therefore, the actual divergence in expectations may be larger than shown.

The authors have not been able to identify other studies that directly compare patients' and GPs' attitudes in a similar way. A recent study investigated patients' propensity to seek health care in different healthcare systems.[16] The organisation of primary care, as well as patients' perceived communication with their GP, was highly correlated with patients' decision to seek health care, but the authors did not look into GPs' attitudes. A recent Swiss study found that GPs underestimate the

Table 4. Comparisons of patients' and their GPs' expectations regarding healthcare-seeking behaviour. Multiple logistic regression (GEE), corrected for patients' age and sex, GPs' age and sex, size of patient lists, and geographical location of practice. OR indicates the probability of the GPs answering Yes, with patients as reference group

Will people with the following complaints usually visit their GP?	**GPs (reference: patients)**		
	OR	95% CI	*P* value
Severe cough	3.4	1.1 to 10.5	0.04
Abdominal pain	2.7	1.2 to 6.5	0.02
Deteriorating vision	4.2[a]	2.5 to 6.9	<0.001
Sprained ankle	1.4	1.0 to 2.0	0.07
Anxiety	3.0[a]	1.5 to 6.0	0.002
Relationship problems	1.5	1.1 to 2.1	0.02
Sexual problems	1.8[a]	1.3 to 2.6	0.001

[a]Indicates significant differences, $P \leq 0.002$. CI = confidence intervals. GEE = generalised estimating equation. OR = odds ratio.

satisfaction of their patients.[17] A Dutch study from 1999 found that GPs working within a referral system, like in Norway, saw themselves as the likely first point of healthcare contact for patients with psychosocial problems, but patients' attitudes were not reported.[23]

Implications for practice

Both age and sex influence patients' expectations to what GPs can help them with. Older patients have higher expectations of benefitting from a GP visit and find it more important than younger patients to see a GP in the presence of several health complaints. The results suggest that Norwegian GPs overestimate to what degree their patients will see them for a variety of common medical problems, in particular psychosocial issues. Patient-centred health services necessitate knowledge concerning which types of problems patients are likely to consult for, and patients must be informed about the services offered by GPs. If the observed differences represent an actual divergence in expectations between GPs and patients, it should have implications for measures taken to contribute to a more rational and cost-efficient use of healthcare services.

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Ethical approval

The QUALICOPC study was presented to the Regional Committee for Medical and Health Research Ethics in South-Eastern Norway. They concluded that their approval was not required for this study. The study was conducted as part of the European QUALICOPC project.

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