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Exploring the role and experience of Norwegian General practitioners with antibiotic prescription: A qualitative study

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Abstract:

Background: Antibiotics have been topic of interests for medical sciences and medical profession over many decades. In modern medical sciences antibiotic resistance is one of biggest challenge that interrupts the use of antibiotics. There are different factors associated with antibiotics resistance including overuse and misuse of antibiotics. The General practitioners are first line health service provider and antibiotic prescribing authority. In recent medical practice it is important to explore different factors related to antibiotics resistance and promote enabling factors of optimal use of antibiotics.

Aim: This study aims to explore the experiences of Norwegian GPs regarding antibiotics use and antibiotics prescription in Norway. In existed studies there is less focus on the experience of GPs on antibiotics use and prescription in Norway. This study will provide a deep insight of this subject.

Methods: A qualitative research method has been used, informed by theory of power and its expression. There have been 8 interviews of Norwegian GPs conducted in this study using semi-structure interviews guided by a interview guide. The collected data is than analyzed using thematic analysis technique.

Results: Through data analysis two key themes were overarched from different sub-themes. The first theme relates to enabling factors of optimal use of antibiotics and minimal antibiotic resistance, and second theme relates to regulatory and facilitatory challenges for GPs in antibiotic prescription. The use of antibiotics is optimal and prescription is based on clinical examination and medical diagnosis according to participants. The available guidelines for antibiotics prescribing practice are enough, resourceful, and easy to follow, and there is minimal antibiotic resistance in Norway. There are different challenges that constrain prudent use of antibiotics and increase antibiotic resistance. The patients from immigrant background, travelers and workload on GPs are some of the challenges that are linked with increased antibiotics resistance and unnecessary use of antibiotics in Norway.

Conclusion: The findings reveal that prescribing of antibiotics by GPs is guided by guidelines provided by regulatory authorities and its based on clinical findings rather than patients demands. The GPs experience with patients and health regulatory authorities is generally positive. The challenges of GPs regarding workload should be addressed in proper way to secure high-quality of health services for patients. There is a continuous need of efforts to use antibiotics effectively and to combat antibiotic resistance in Norway. This study supports future research on antibiotic resistance and different challenges associated with antibiotics use.

#Chapter 1

1.1 Introduction and background

Antibiotics are commonly prescribed in medical profession worldwide and that makes antibiotics relevant to public health. The word “antibiotic” derives from two classical words, anti (“against”) and bios (“life”), thus antibiotics are, in principal against life of bacteria (Walsh & Wencewicz, 2020). Sometimes referred to as antimicrobial agents, antibiotic drugs (antibiotics) encompass molecules of low molecular weight that are selectively against bacterial life (Walsh & Wencewicz, 2020). In general, antibiotics intend to treat and prevent bacterial infection (Patel et al., 2023). These antibiotics can be taken by mouth as liquids, tablets, and capsules, or they can be given by injection (Adlemen, 2023). Some of these drugs are also available in the forms of creams, ointments and lotions to apply on skin or other body parts (Adlemen, 2023). Continuous research on effectiveness of antibiotics and to manage bacterial infections related health threats has become interested aspect of global health over the years (Ren et al., 2022).

Prior to beginning of 20th century, infectious diseases accounted for high morbidity and mortality rate and average life expectancy was 47 years worldwide (Adedeji, 2016). Infectious diseases can be defined as, an illness or infection caused by invasion of pathogens or microorganism, e.g. bacteria, virus and protozoa (Vynnycky & White, 2010). The infectious diseases have both economic and social risks which threaten the global health system in terms of medical treatment and outbreak control (Bloom & Cadarette, 2019). These threats are largely having severe consequences in the form of increased morbidity and mortality (Bloom & Cadarette, 2019). According to a report of global infectious disease,

these diseases are global health threat and were estimated about 54 million death across the globe by 1998 (Zelikow, 2000). In this context, antibiotics use, and antibiotics prescription are important to discuss to obtain wider and long lasting global and local health outcomes.

The antibiotics have revolutionized the treatment of infectious disease. The discovery of these drugs have played an essential role in society by saving millions of lives (Hutchings et al., 2019 and Fabbretti et al., 2011). For example in US, the leading cause of death has changed from communicable disease to non-communicable disease, and average life expectancy rose to 78.8 years (Adedeji, 2016). The treatment of bacterial infections in both human, animal and non-medical appliances is possible because of antibiotics (Serwecińska, 2020). Transformation of modern medical science, treatment of bacterial infection, possibilities to perform vital therapies and medical procedures are some of gains due to antibiotics (Cook & Wright, 2022). For instance, medical processes such as organ transplant, cancer therapies, safe surgeries, prevention and treatment of infectious disease are possible by using antibiotics (Fabbretti et al., 2011). A study conducted on age group from 1-59 in subSaharan African countries shows that childhood mortality was reduced by 13.5% by using antibiotics in certain diseases. Therefore, it is evident that optimal use of antibiotics has potential effect on the overall reduction in mortality (Abat et al., 2018). Despite of all these achievements antibiotics use have some challenges involving antibiotic drug resistance over time of use (Cook & Wright, 2022). Therefore, antibiotics are important to discuss because of their ability to treat and prevent certain infectious disease. In this context a significant threat to medical achievements of antibiotics, is overuse and misuse of antibiotics which can have negative health impacts to public health. Therefore, it is important to control the use of antibiotics to get maximum medical benefits, and different aspects of antibiotics may be researched to increase global education on antibiotics.

1.2 Over and misuse of antibiotics and antibiotic prescription:

According to world health organization, the overuse and misuse of antibiotics are major public health concerns and main factors that can decrease the effectiveness of antibiotics (WHO, 2021). Global antibiotics consumption increased by 65% in the period of 2000-2015, thus, global antibiotic consumption must be decreased to reduce the threat of antibiotics overuse (Abat et al., 2018). The global annual production of antibiotics is estimated to be as high as 100-200 thousand tons with more than 1 billion tons having been produces since 1940 (Serwecińska, 2020). The growing problem of unnecessary use of antibiotics has made formerly routine therapy of many infectious disease challenging, and impossible in some cases (English & Gaur, 2010). Such overuse has resulted in a substantial increase in the rates of growth of drug resistance in bacterial strains; this depicts a global health problem to human health (Serwecińska, 2020). Moreover, the spread of drug-resistant pathogens, threatens ability of medical professionals to treat common infections and to perform lifesaving procedures (WHO, 2021).

Antibiotic resistance is the ability of microbes to evolve a mechanism in such way that the effect of antibiotics becomes less (Friedman et al., 2016). Antibiotic resistance is a one of top global public health and development issue, and it is estimated that antibiotic resistance was directly responsible for 1.27 million and contributed to 4.95 million deaths globally in 2019 (WHO, 2021). There is an estimation of about 700000 annual deaths and if prognosis remains same, it can increase to 10 million annual death by 2050 along with estimated cost of 100 trillion US dollars globally, due to antibiotic resistance (Dadgostar, 2019). In this context antibiotic resistance is a critical public health problem in morbidity, mortality and economically aspects (Dadgostar, 2019). Prolonged hospital stays, disability, and need of more expensive medicines and deaths are some of the resultant challenges due to antibiotic resistance (WHO, 2021). It is therefore, generally recommended that health practitioners and

physicians, should restrain from unnecessary antibiotics prescriptions as this has huge benefits from a public health perspective (Porco et al., 2012).

Antibiotic resistance add up number of infections, interrupts activities in treatments in hospital and limits the treatment options that leads to treatment failures, along with increase in severity of underlying illness and delays in effective therapies (Friedman et al., 2016). Therefore, it is important to explore the different factors that enable prevalence of antibiotic resistance in Norway to understand and to combat this public health dilemma. The public are being increasingly engaged in efforts to contain bacterial resistance because they can generally play a positive role in controlling the use and antibiotic resistance (Hawkings et al., 2007). In this perspective, my research project is very important as it circulates between the General Practitioners, patients, and regulatory authorities. If public understands and follow the recommendations of GPs, so over or unnecessary use of antibiotics and resistance of antibiotics can be minimized to considerable extent.

1.3 Antibiotics use and resistance in Norway:

An increasing trend in use and antibiotics resistance globally has potential impacts on Norwegian health system due to millions of travelers in and outside of country every year. As with global trend antibiotic resistance is also increasing in Norway, and due to increasing antibiotic resistance, Health directorate has some new local antibiotic prescribing guidelines from 2013 and 2019 for the primary health care for safe use and optimal prescribing of antibiotics (Lindbæk et al., 2013). In Norway, in 2022 number of prescriptions prescribed per 1000 resident were 334 which is an increase from 292 in 2022. Therefore, it is aim of Norwegian health authorities to minimize the number of antibiotic prescription and unnecessary use of antibiotics to contain resistant bacteria (Helsedirektoratet, 2023).

Norway has relatively low use of antibiotics per resident and trends show reduction in use of low-spectrum antibiotics , whereas there was a increasing trend in broad-spectrum antibiotics use (Waaseth et al., 2019). In general, the prevalence of antibiotic resistance in respiratory pathogens in Norway is lower in comparison to other European countries (Kristiansen et al., 2001). In Norway about 84% of antibiotics prescriptions are prescribed in out-patients and these prescriptions are generally prescribed by General Practitioners (GPs) (Skow et al., 2023). In other Scandinavian countries about 90% of antibiotics prescription are prescribed by GPs (Odenholt et al., 2002). In this context, GPs are central part as they are only prescribing authority, out of hospitals and that's why GPs prescribing antibiotics can lead to an optimal or unnecessary use of antibiotics. Therefore, there is more focus to regulate the antibiotics prescribing practices in primary health care in Norway. This study may help to highlight the different challenges to regulate medical practice and may propose potential interventions for better health outcomes.

Antibiotics use in chlamydial infections are regulated for GPs in primary health care system and broad-spectrum antibiotics are not recommended in children according to 2013 and 2019 antibiotics prescribing guidelines (Lindbæk et al., 2013).There are inclusive chapters and guidelines for health practitioners regarding selection, dose and changes in treatments for children. Therefore, the GPs in Norway as with everywhere else globally, plays a significant role mediating between the provided guidelines of antibiotic prescription by states and patients. That's why the GPs have a direct responsibility to uphold state and health institute provided guidelines, meanwhile satisfying the needs and some demands from their patients, making their role unattainable and unease sometimes. By this background, the GPs play a significant role in antibiotic prescription and antibiotic regulation in the Norwegian context.

1.4 Problem statement:

The purpose of this study is therefore, to explore the experiences of GPs and their role mediating between the patients and guidelines provided by health authorities. This study determines to seek and understand how GPs approaches the difficult role of satisfying the needs of their patients while adhering to state guidelines. This study is significant as this study gives an overview in understanding the relationship between doctors and their patients while at the same time exploring how and under what circumstances do the GPs stick to the state guidelines on antibiotic prescription and safe use. This study therefore, aims to explore the role and experience of Norwegian General practitioners with antibiotics prescription and how they maneuver between the need to follow state regulations while also satisfying their clients need. To achieve this aim main research objective, the following sub-questions are defined to explore deeply the objectives of this study:

1. What are the experiences of the Norwegian General practitioners (GPs) with use and prescriptions of antibiotic?
2. How do GPs negotiate, mediate, and reconcile the needs of both the patients and the state when with regards to antibiotics use and prescription?

The next chapter will provide a detailed and nuanced literature review of this topic.

#Chapter 2

2.1 Literature review:

This chapter provides relevant literature on antibiotics, use, antibiotics resistance and the role of general practitioners (GPs) in antibiotics prescription. Literature search was conducted in different databases such as PubMed, Medline, and different search engines, including reference list of relevant studies. National and international platforms and websites such as

WHO, Health directorate, Norwegian institute for public health are used to gather grey literature, that is in the context of this study. Different relevant studies, reports, guidelines, and websites mentioned in literature are significant in this study.

Previous literature has reported some of the medical benefits of antibiotics over time. Antibiotics are regarded very important in medical field, these drugs treat and prevent simple infections and aid in safe surgeries, organ transplantations, cancer therapies and other complex medical illness (Fabbretti et al., 2011). Antibiotics are also helpful in increasing expected life span by changing outcome of bacterial infection (Ventola, 2015). Joint replacements, organ transplants and cardiac surgeries are also carried safely by using antibiotics (Ventola, 2015). However, different studies depict that misuse and overuse of antibiotics in recent decades have accelerated the phenomenon of antibiotics resistance, in this phenomenon antibiotic drugs become less effective (Mancuso et al., 2021). Antibiotic resistance is one of biggest risk that is connected with the overuse of antimicrobial agents (Llor & Bjerrum, 2014). Overuse of antibiotics is associated with prescription and therefore, physicians sit at the center in this matrix, making this study current and relevant.

2.2 Antibiotics resistance in Norwegian and international contexts:

Existing studies show that in the field of medical sciences antibiotic resistance is a greatest threat due to sharp increase in events in both in Europe and globally (La Fauci & Alessi, 2018). Globally resistance in antibiotics can also affect the Norwegian health system (Elisabeth et al., 2017). Norway, because of modest antibiotics use has low prevalence of antibiotics resistance in compare to other European countries (Haug et al., 2011). Increased bacterial resistance is linked with high number of antibiotics consumption, and in Norway consumption of antibiotics is low in comparison with other European countries, Kristiansen found that despite use of antibiotics in Norway is low, Norwegians travelling to southern

Europe may have returned with resistant bacteria (Kristiansen et al., 2001). A study conducted in Norway and Belgium depicts that there is a relation of antibiotics sale and antibiotics resistance, and the extent of antibiotics resistance is more in Belgium in consequent to more sales as compare to Norway (Kristiansen et al., 2001). The most preventive measure suggested to decrease in antibiotics resistance in this context is to limit the use of antibiotics using short-spectrum antibiotics (Elisabeth et al., 2017). Exploring the antibiotic prescriptions and use could therefore be relevant in public health research and medical practice in this context.

About 90% of all antibiotic prescription are prescribed by GPs and respiratory tract infections are leading cause of antibiotic prescribing and over prescribing is particular problem in primary care, where viruses cause most infections (Llor & Bjerrum, 2014). It is estimated that 84% of antibiotics prescriptions are prescribed outside the hospital and most of them are usually written by GPs in Norway (Skow et al., 2023a). Thus, general practitioners have main role in appropriate use of antibiotics. A 7-case study performed in Norway, Sweden and Denmark to measure patterns of antibiotics prescription differences, and study shows some differences in patterns of prescriptions in these countries (Odenholt et al., 2002). According to a study of Norwegian prescription trends , overprescribing in general practice have a high proportion of inappropriate prescription (Skow et al., 2023b).

There are may be different factors that leads to inappropriate prescription and to measure such factors, a study conducted in Spain depicts that most use of antibiotics occurs in primary health care system and GPs are main part of primary health care system (Vazquez-Lago et al., 2012). A qualitative review explored the GPs concerns over antibiotic prescription, and main finding of this review suggest GPs attitude, feelings and anxiety or fear concerning prescribing, lead them to over-prescribe antibiotics (Rose et al., 2021). A reduction in antibiotic consumption leads to a reduction of resistance (Llor & Bjerrum,

2014b). Therefore, it is important to explore diverse factors of increasing antibiotic resistance to reduce risk associated with this phenomenon.

One of the factor of unnecessary antibiotic prescription are that those prescriptions not according to regulations and that count is approximately 20 to 40% according to Canadian medical association journal, and another study shows that 23% prescriptions are not appropriately prescribed by outpatients in USA (Mercer, 2019). There are also other factors that play an important role in prescribing antibiotics in inappropriate way including patients understanding that why they don't need antibiotics, high volume of patients on physicians, and lack of time to briefly explaining the right and safe use of antibiotics (Mercer, 2019). In this scenario, it would be useful to measure different factors of inappropriate prescriptions of antibiotics in Norway to develop policies and guidelines that may help appropriate use of antibiotic prescriptions.

2.3 Antibiotic prescription and doctors experience:

GPs play a basic role when it comes to prescription in primary health care system and a substantial amount of antibiotics prescription is prescribed in primary health care system. A study conducted to explore the perception of GPs on getting antibiotic, describes that generally, patients influence to get antibiotic prescriptions (Stevenson et al., 1999). A united kingdom based study reveals that patients were less satisfied from GPs if they didn't get antibiotic prescription according to patients expectations (Ashworth et al., 2016). The need to maintain patient satisfaction for good doctor-patient relationship was found a driver for over-prescribing (Rose et al., 2021). GPs attitude of prescribing antibiotics will be helpful to promote good relationship with patients, helps to retain patients, ends consultation quicker, and relieving anxiety was one of reasons of over-prescribing antibiotics (Rose et al., 2021).

General practitioners too often prescribe antibiotics treatments and they don't follow recommended guidelines (Colliers et al., 2020). Time and financial incentives, patients pressure, and lack of patient education and patients awareness are some factors for over-prescribing antibiotics (Rose et al., 2021). A cautious approach of antibiotic prescription requires trade-off in terms of patients satisfaction (Ashworth et al., 2016). It is important to keep the level of antibiotic prescribing low in order to reduce the development of resistant bacteria (Björkman et al., 2011). In this context it would be interesting to find that how Norwegian GPs experience antibiotic prescription.

There are several studies that show the differences prescribing trends and one of those studies show that, there is a difference in prescribing of antibiotics in overall health and medical condition (Hulscher et al., 2010). In general practice bronchial infections and urinary tract infections are main indications where antibiotics are prescribed (Hulscher et al., 2010). Antibiotics are prescribed according to indications and medical conditions ranging from 46% of patients with common cold and 69% of patients with upper respiratory infections (Steinman et al., 2003). A comparative study shows that in Netherlands, there is a downward trend of these prescriptions as compare to other European countries, however this trend is just in narrow spectrum antibiotics (Hulscher et al., 2010). Broad-spectrum antibiotics were commonly prescribed in acute respiratory tract infections like common cold and bronchitis, and that's necessary as well (Steinman et al., 2003). The above-mentioned studies show a contrast prescribing trends in different countries in different medical conditions, and it would be interesting to know the prescribing experience of GPs in different indications and medical conditions in Norway.

There are many studies that are conducted to explore the different interventions by GPs to decrease unnecessary antibiotics prescriptions in primary health care system. One of these studies is conducted in four south American countries that included 171 doctors in focus

group. This study performed to understand antibiotic prescription from doctors, and a substantial number of doctors answered that different interventions can help in reducing antibiotic prescriptions (Urbiztondo et al., 2018). Imperfect knowledge, uncertainty of diagnosis, fear of disciplinary cases and complications, and influence from the patients to get antibiotic prescriptions are some of the reasons for inappropriate use of antibiotics (Hulscher et al., 2010). Another study shows that negative events like misdiagnosis, adverse drug interactions and unexpected deaths or experience of using different antibiotics increase possibly overprescribing the antibiotics (Al-Azzawi et al., 2021). In some of the instances, financial interests are also involved in prescriptions of antibiotics (Hulscher et al., 2010).

One of the challenges that doctors face is to tell the differences between viral and bacterial infections to patients and uncertainty of diagnosis, that leads to unnecessary antibiotics use (Hulscher et al., 2010). According to a survey of WHO in 12 countries reveals that 25% of participants in all 12 countries believe that they can use same antibiotic given to a friend or family member if they have same symptoms (WHO, 2015). According to international journal of medical microbiology, a study of Americans reveled that cold will be cured faster with antibiotics and they were supposed to get prescription from GPs to cure cold (Hulscher et al., 2010). In contrast, a cross sectional study in Norway, revealed that Norwegians had a high overall knowledge and understanding of antibiotic resistance (Waaseth et al., 2019). According study, it is manifested that a substantial numbers of participants knew that bacteria can become resistant against antibiotics, and unnecessary use of antibiotics can make them less effective (Waaseth et al., 2019).

There are also different studies that are performed to explore the influences of patients on doctors to get antibiotics prescription. One of those a qualitative study carried out in UK reveals that its challenging for GPs to optimize antibiotics prescriptions particularly in faceto-face consultations (Van Der Zande et al., 2019). According to British journal of general

practices an Irish study describes that a GPs decision for antibiotics prescriptions may be influenced by whether a patient pays or not (Murphy et al., 2011). A survey held in UK and had about 1000 GPs as participants and most of GPs answered that they get pressurize by patients for getting antibiotics prescription (Cole, 2014). A private patients is most likely to get a antibiotics prescription than a government hospital (Murphy et al., 2011). About 55% of GPs answered that they were pressurized by patients to prescribe antibiotic, even when they knew that its not necessary, and 45% of GPs answered that they prescribed antibiotic in viral infections knowing that they wouldn't be effective (Cole, 2014). Negotiations with patients and public health demands, need consistent and supportive practical-level policies, can help appropriate antibiotics prescribing in primary health care system (Van Der Zande et al., 2019). In this context this study is important because of its relevance to medical practice of GPs in Norway and patients response to use of antibiotics use.

The above-mentioned studies are demonstrating that how GPs experience antibiotic prescription and deal on clinical basis to meet patients' expectations, while adhering with international and state guidelines. This study also aims to find and explore that, are Norwegian GPs are influenced by patients, and how they adhere to guidelines for optimal prescribing practices. This type of study would be very interesting in Norway as per my best knowledge such type of study is not conducted here before. Moreover, in the context of Norway where health exclusively is provided by state, it would be readable to explore the experiences and perspectives of the GPs in both facilitating and regulating the use of antibiotics.

2.4 International guidelines for antibiotics use:

There are different international guidelines available regarding regulations of antibiotics. Those guidelines are based in different indications and medical conditions. The available

guidelines can differ geographically as some areas in world are more susceptible to antibiotics and use of antibiotics is more as compared to other geographical areas in world. This literature review depicts some strategies to reduce antibiotics use and consequently resistance, including some general guidelines to health professionals.

According to journal of antibiotics resistance and chemotherapy, appropriate use of antibiotics is defined by WHO "the cost-effective use of antimicrobials which maximizes clinical therapeutic effect while minimizing both drug related toxicity and development of antimicrobial resistance" (Levy-Hara et al., 2011). According to international journal of antimicrobial agents and journal of antibiotics chemotherapy, health professionals and policy makers should follow the following guidelines for optimal us of antibiotics. Only bacterial infections should be treated with antibiotics, and non-bacterial infections like common cold may not be treated by antibiotics in primary health care system (Cantón et al., 2022). Antibiotics use should be limited while treating fever, and use of antibiotics should be prescribed where there is necessary (Levy-Hara et al., 2011). While prescribing antibiotics indication severity should be considered, and antibiotics therapy should be reduced to eradicate risk factors of developing resistance (Cantón et al., 2022).

Antibiotics with higher likelihood of promoting resistance should be prescribed as a last option, and patient compliance is necessary while prescribing these medicines, if patient is not compliant with antibiotic the best of therapy would be failed (Levy-Hara et al., 2011). A international survey held to find the facts of antibiotic prescribing in patients with Covid 19 that describes, probability of superinfection and increase workload of prescribers, may lower threshold of antibiotics leading overprescribing and antimicrobial resistance (Beović et al., 2020). National and international strategies for the control of antibiotic resistance and safe use of antibiotics require the education of both health professionals and public (Finch et al., 2004). In this context it is equally important to GPs, as mentioned earlier that they prescribe

the most antibiotic prescription, and public to follow the given guidelines regarding antibiotic prescription. There are lot of antibiotics prescribing guidelines in different indications and to mention all those guidelines was not possible that's why some general guidelines are mentioned here.

2.5 Europe union guidelines for antibiotics use:

The prescribing guidelines are vast and are according to medical conditions, to mention all those would be difficult; the aim of this sections is to get general prescribing guidelines and recommendations to prescribe antibiotics in Europe. Here are some of Europe based guidelines give a brief description to member states in in developing and implementing national strategies to promote appropriate use of antibiotics followed by health professionals. According to European journal of public health, In Europe union countries antibiotic resistance is responsible for 25000 deaths, while infections resistance to multidrug resistance growing significantly (Forsberg, 2017). A national action plan is given to member states to inhibit and monitor antibiotic resistance. According to national action plan a reporting system to report antibiotics resistance should be adopted by all members countries (Hakanen et al., 2017). This plan of action emphasizes also on identification, reporting and ensuring the updated local and general guidelines and training of health professionals (Hakanen et al., 2017).

In European hospitals antibiotic resistance is a financial burden along with prolonged illness with serious health consequences (Kaier et al., 2008). Family resources used on prolonged treatments may result in loss of both confidence of health professionals and confidence of patients on health system (Kaier et al., 2008). Prolonged stays of hospitals and incidences of deaths, are at least two times higher for infection with drug-resistance bacteria as compare drug susceptible bacteria which results in increase costs of treatments (Kaier et

al., 2008). European antimicrobial resistance surveillance system (EARSS) has generated valid data on antibiotics resistance with clinical and epidemiological relevance, and data shows that antibiotic resistance problem is increasing in all European countries (Kaier et al., 2008). In this regard it is interesting to explore Norwegian GPs point of view regarding prescription and use of antibiotics in future.

Europe union report on antibiotics prescribing guidelines reveal that prescribers are responsible to make a proper use of antibiotics in patient care, this report also shows that prescribers should be equipped with proper training, information and guidelines to perform their duties regarding optimal and safe use of antibiotics (Iosifidis, Elias et al., 2017). According to a survey in Europe union area including 30 countries in the study recommends there are certain interventions that are necessary to combat antibiotic resistance, education, resources, guidelines which focus specifically on rational use of antibiotics are necessary (Ashiru-Oredope et al., 2021). A European base study recommends that the detection of bacterial resistance and its reporting to clinicians, public health officers and a wider audience to increase awareness is necessary to control antibiotic resistance (Cornaglia et al., 2004). Moreover, prescription of antibiotics in accordance with guidelines, at appropriate shortest effective dose, with appropriate route of administration are necessary to contain antibiotic resistance (Iosifidis, Elias et al., 2017). European union commission recommends surveillance of collecting, reporting and monitoring the data regarding antibiotics is necessary for resistance diagnosis and monitoring (Cornaglia et al., 2004). These are general guidelines mentioned here there are also other guidelines available in Europe according to different indications and country wise, in next section guidelines of antibiotics prescribing and strategies to minimize the use and inhibit resistance in context of Norway are provided.

2.6 Norwegian guidelines of antibiotics use:

According to national strategy of antibiotics 2015-2020 it is emphasized that significance of antibiotics is imminent, and availability of antibiotics is necessary to carry out treatment practices in Norway (Skjerdal, 2015). The aim of Norwegian national strategy against antibiotics resistance, is to reduce the antibiotics use per inhabitant by 30% (Waaseth et al., 2019). However, strengthening basic knowledge among prescribers and society, optimization of prescribing practice, improved strategies of infection control, and international cooperation are to be considered to participatepe in inventing new vaccines, discovery of new antibiotics, and diagnostic equipment's (Skjerdal, 2015). Participation of all stakeholders is important in implementation of national strategy, and from this context, an exploration of role of GPs could be of interest of both research and public health practice in Norway.

According to a status report of national action plan against antibiotic resistance, to fight against antibiotic resistance, continuous efforts are needed to minimize the use of antibiotics in primary health care (Helsedirektoratet, 2019). Antibiotics prescription guidelines are available on health directorate website and these guidelines are mentioned one by one according to specific indication. The National Institute of Public Health also provides different types of proposals and suggestions to health professionals and to increase public awareness regarding antibiotics prescription, safe use, and resistance in bacteria. The data collected in this study mentioned that it is mandatory for participants self-routine to check health directorate whenever to prescribe an antibiotic to patients. It is difficult to mention all these guidelines due to many indication-based guidelines, some national strategies are mentioned.

This literature review has produced a different aspect of the topic to explore the GPs experience regarding antibiotics use and prescription. It is obvious that GPs have key role and leading authority in health system to prescribe antibiotics globally as well as in Norwegian health system. That's why to explore the experiences of GPs is important to get a deep insight

of understanding antibiotics use. The reviewed studies gave important findings on the topic and highlighted the complexity, similarities, and contrasts of the topic. There are many unanswered questions in the review and some literature gaps as well. While literature highlighted the significant progress to understand antibiotics use, prescription and GPs role as health service provider. However, there are limitations and gaps, this review contributes to existing knowledge and reveals comprehensive overview regarding the current scenario of research on the topic of antibiotics use. Increasing antibiotic resistance can cause unnecessary burden to health systems and health professionals. In this context this study is important to find the driving factors of prescription of antibiotics and use of antibiotics in the Norwegian context. This study can help to get insights of GPs and clients of Norway about antibiotics use and awareness regarding antibiotic resistance.

2.7 Gaps in literature:

The existing studies have provided valuable insights in relationship with GPs role as a health service provider and facilitating the obligatory responsibilities directed by regulatory authorities and satisfying the patients' medical needs. These resources are very helping to understand somehow patients-relation with doctors. However, in this mentioned literature I couldn't find to my best knowledge, studies on GPs, denying prescribing, and if yes, in which scenario they do deny and how do they explain it to their patients. Most of studies are criticizing on overprescribing, but influential role of patients on doctors are not so much discussed. Presented Literature describes about the importance, safe use, reduction in use of antibiotics, including factors of increasing antibiotic resistance, Strategies to inhibit resistant bacteria, and consequently financial burden on health systems are described. However, role GPs to facilitate between patients and state guidelines is under-discussed. Thus, this type of study can provide a better overview on antibiotics prescription behavior and clinical negotiation for better patient's outcome by maintaining good patients-doctor relation in

adherence to guidelines and regulations. This study can also provide better insights of Norwegian health care system as GPs in Norway are first and most available health care providers, and mostly patients remain in contact just with GPs for whole of their life. This study can also provide the insights of working cooperation of different parts of health care system in Norway.

2.8 Theory

In research theory is important to design research questions and it guides towards selection and interpretation of relevant data. Theory proposes explanations of causes and influences (Reeves et al., 2008). The theoretical framework in this study is to explore experiences of GPs as health service provider to costumer within limits of guidelines and regulations. In this project different stakeholders are on different level of designations, making power relations and responsibilities an important aspect in this study. Therefore, exploring theoretical and conceptual frameworks that may explain the power dynamics between patients, health professionals and public health regulatory authorities in Norway can be interesting. Exploring the experiences of GPs through in the light of theory of power can find the important insights of health care dynamics, professional relationships, and decision-making processes in context of Norway.

2.8.1 The concept of power:

Power is a contested concept in social and political theory (Avelino, 2021). According to weber “power as actor-specific resources used in pursuit of self-interest” cited by (Avelino, 2021). In this study different dimensions of power are discussed to explore GPS experience with antibiotic prescription and regulations in Norway. The concept of power in this study is to understand that power is distributed in different stakeholders. In this project there is an

asymmetry in GPs and other stakeholders, patients and regulatory authorities that can influence the decision making of prescribing antibiotics.

2.8.2 Expression of power:

The concept of power and its dimensions will give a better understanding on this topic by explaining different dimensions and forms of power, and how those influence relationships, decision making in different contexts including on antibiotics prescription. Power is classified in different types and these types are power over, power within, power to, power with (Mosedale, 2005). Power over can be explained as A has power over B, in this study A can be referred as GPs that have power over B referred as, costumers or patients, but in Norwegian context it can be a little bit of difference as costumers B have also power on GPs A. Power within referred as, assets such as, self-esteem and self-confidence, and power to is to increase boundaries to achieve something without tightening boundaries for other party (Mosedale, 2005). In the context of this study GPs have power over costumer, but regulatory authorities have power over GPs, however costumers have power on GPs to some extent.

Power with refers to collective action, recognizing that more can be achieved by collective actions than individuals (Mosedale, 2005). Informed by theory of power, the selection of participants was aimed to explore the differentiation of power to capture diverse perspectives. In This study there are different stakeholders of power, including health care provider, the GPs, policy makers and guidelines giver, the Regulatory authorities and health caretaker, the patients. After collection of data thematic analysis was used to mitigate and explore the different ways of power sharing and to make power related themes.

#Chapter 3

3.1 Methodology:

The methodology chapter of this thesis describes research method and research design employed to explore the experiences of Norwegian general practitioners and how they experience antibiotic prescription. In addition, how GPs deal with regulatory guidelines while considering patients compliance. This chapter provides the rationale for qualitative approach by using qualitative techniques to provide a comprehensive understanding of this topic. The selection of a qualitative research design is considered by the need of complex interplay between Norwegian GPs, patients, and regulatory measurements. Qualitative research design is selected as this study aims to explore the experience of Norwegian GPs regarding antibiotics use and prescription, and GPs mediation between patients and regulatory authorities. Moreover, qualitative interviews were conducted to explore the experiences, approaches, and behaviors of GPs to facilitate both guidelines and patients. To perform qualitative interviews a semi-structure interview guide was developed to lead in depth discussions, allowing participants to communicate their perspectives in their own way. Thematic analysis was employed from qualitative data to find key themes and patterns. Qualitative research method provides a brief perspective (Bryman, 2012), on a complex phenomenon of GPs experience regarding antibiotic prescription, this study seeks to give a better overview of antibiotic use and antibiotic resistance in Norway.

3.2 Study approach:

This study used a qualitative method and this method illustrates concepts and interpretations related to research procedures (Graneheim & Lundman, 2004). This study is focusing on

exploring the experiences of Norwegian GPs and to understand that how they experience antibiotic prescription, and how they deal with patients and regulatory authorities. Therefore, a qualitative study approach is most appropriate technique to perform because it is focusing on personnel experiences (Brinkmann, 2022), and meaning making from own perspectives and interpretations of GPs. In addition, to explore experiences of GPs on antibiotic prescription, interviews can give a most explorative and detailed information and explanation.

3.3 Study design:

A case study is an appropriate research design when someone wants to gain concrete, contextual, and depth knowledge of a specific real world subject (McCombes, 2019). In case studies a case is selected, theoretical framework is made, data is collected, analyzed, described and then reported (McCombes, 2019). This study in this context, is a case study as this study entailed the selection of framework, collected data, analyzed the data, described, and reported the data to find the answers to research questions.

3.4 Philosophical and epistemological considerations:

In this study social constructivism is used as the philosophical and epistemological bases for exploration of experiences of GPs in antibiotic prescription and regulations. In social constructivism it is believed that knowledge is produced through human activity (Beaumie, 2006). One can reach to human activity through a detailed examination of social and cultural experiences (Beaumie, 2006). Basic qualitative performance to capture experiences and worldviews in this context is debate and explanation rather than consensus (Graneheim & Lundman, 2004). Therefore, in this study experiences of GPs are taken in forms of interviews to understand the influence of patients while limiting prescribing according to regulations.

3.5 Selection and recruitment of participants:

In this study a purposive sampling strategy was used. Purpose sampling strategy refers to a group of non-probability sample techniques, in which units are selected because they have the characteristics that you need in your research (Nikolopoulou, 2022). A specific research may include the relevant participants, who have competency, knowledge and information to answer the relevant questions (Bryman, 2012). In this study participants were general practitioners who have been working in Norway, were interviewed. The general inclusion criteria for recruitment of participants were that they have been working in Norway as GPs for at least previous 3 years. To consider that in 3 years GPs should have good knowledge on the use of antibiotics and trends in prescriptions. The time of 3 years is probably enough time for GPs to have known and interacted with their cliental base as well as getting a deep insight of state regulations on antibiotic use and prescription. The GPs in Norway usually work in emergency as well, so the participants had experience from both as GPs and doctors in emergencies. In this study 8 participants who have been working in Norway as GPS for at least previous 3 years were interviewed through a semi-structure interview-guide.

I used my professional network to recruit GPs. I made initial contact with 3 GPs then I used snowball method for further recruitment. Snowball method is a research method technique where researcher samples initially a small group of relevant participants that are relevant to research questions, and these sampled participants, then propose further individuals, relevant to research (Bryman, 2012). The first 3 recruited participants then helped me to recruit further potential participants. The agreed participants then requested to ask further participants who fulfil the inclusion criteria (Parker et al., 2019).The agreed participants were shared consent forms for further understanding of research project. Snow ball method is one of most popular method in qualitative research to recruit participants (Parker et al., 2019).

3.6 Description of participants:

The details of participants background information's are mentioned in table 1,

Table 1: characteristic of research participants :

#	Name	age	sex	Job title	Job experince as GP in Norway	specialization
1	Zeg	50	M	GP	14	Medical practitioner
2	Tor	40	M	GP	13	Medical practitioner
3	Mari	27	F	GP	3	No
4	Aiza	37	F	GP	7	No
5	Ivar	36	M	GP	7	Physician
6	Addy	38	M	GP	8	Oncologist
						Orthopedic surgeon
7	Asher	Not given	M	GP	6	Family medicine
8	John	32	M	GP	3	Internal medicine
Total partisipants=8		Average age =27	Males=6 Females=2	All GP	Average GP experience=8	Specialist=6 Non-specialist=2

3.7 Data collection

This study used semi-structure interviews for data collection. This method refers to procedure or technique to find information for research purposes. Interviews are one of the data collection methods. Interviews are most widely used method in qualitative research (Bryman,

2012). Interviews defined by (Brinkmann, 2022) " a face to face verbal exchange, in which one person, the interviewer, attempts to elicit information or expressions of opinion or belief from other person or persons". There are different types of interviews, however semistructure type of interviews was conducted in this study. A Semi-structure interviews are those in which interviews are motivated about specific pre-determined themes (Scanlan, 2020). According to Searle and freeman (1995) reality is socially constructed, and to tap into this reality there is need to work in close collaboration with research participants, allowing them to tell their stories in detail, present their experiences and views. In semi structure interviews, interviewer can ask probing follow-up questions, to gain better understanding of specific matter (Scanlan, 2020). It is a advantage in semi structure interview that it is flexible and questions other than interview-guide can be asked (Bryman, 2012).

Conversation is used to obtain knowledge about others, as people talk to others to know their experience about the world, how they think, feel, act and develop as individuals and groups (Brinkmann, 2022). Interviews were conducted to collect data, considering the socially constructed reality that allowed GPs to express brief experiences, details, stories, suggestions, way of reconciliation and facilitation between different stakeholders. In the context of aim of study qualitative interviewing was best possible way to perform this study and to collect data. Therefore, the technique of semi structure interviews was used in this research project to collect data. According to Bryman, in semi structure interviews interviewer can significantly depart from guide and they can ask new and follow-up questions (Bryman, 2012).

In this project semi-structure interviews through an interview-guide were conducted that comprised on about 20-30 questions. The questions were separated in 3 different sections. All eight interviews were conducted between February to April 2024. It was expected that interviews can vary in between 30 to 60 minutes, but the interviews conducted

ranged, between 20-45 minutes. Out of total 8 interviews, first interview was conducted as a pilot interview. Out of total 8 interviews, the 5 of interviews were taken face-to-face at the job places of participants and 3 interviews were conducted on telephone due to physical unavailability of participants. In interviews all questions from interview-guide including some extra follow-up questions were asked from all participants. The conducted interviews were recorded by the consent of participants.

Afterword's data was transcribed from interview recordings into a transcription, anomied, coded, and patterned all necessary steps to perform thematic analysis. The data collected, was an audio recording, with the consent of participants via Dictaphone app. The audio recordings were stored on Edu-cloud and then transcribed after hearing several times. The transcribed data was coded via f4a and the collected data was analyzed through thematic analysis technique to find trends, patterns and themes from data. Thematic analysis of collected data revealed several key themes and pattern related to the experience of general practitioners with the use and prescriptions of antibiotics.

3.8 Data analysis:

Data analysis is another important aspect of research project. Braun&Clarke technique was used to analyze the collected data via thematic analysis. Thematic analysis is a flexible, accessible and popular method in qualitative research to analyze data (Braun & Clarke, 2012). Thematic analysis provides systematic procedures for generation of themes and codes from qualitative data (Clarke & Braun, 2017). Codes are building blocks of data and themes provide framework for organizing and reporting the researchers analytical idea (Clarke & Braun, 2017). The aim of thematic analysis is to identify and interpret key features of data (Clarke & Braun, 2017). Thematic analysis is method for analysis in qualitative data

involving reading through data and looking for patterns in data to find themes (Villegas, 2022). The thematic analysis of collected data was performed by using six step guide of Braun&Clarke that comprises on following steps, (1) Get familiar with collected data (2) Generate initial codes (3) search for themes (4) Review themes (5) Define themes and (6) Write up (Braun & Clarke, 2006).

After data collection, interviews were listened one by one, two to three times to get thoroughly familiarize with data. After getting a thorough insight of data, data was transcribed from all interviews one by one myself, and codes were generated by using FA4 software. After coding data, initially there were about 134 codes, which were refined into 40 codes. After codes formation, key themes and sub-themes were searched and developed from the coded data, and themes were reviewed, defined and named accordingly. This study is a qualitative study and data is collected through one of qualitative research method, interviews for making codes and themes, thematic analysis is applied for data analysis in this research project. By analysis of data two themes are overarched from the codes and subthemes, themes are shown in first and second table respectively.

Table 2: Overview of developed themes and sub-themes:

1	Codes	Sub-theme	Theme
	-Prescription is on medical grounds -Clinical examination-based decision -Importance of diagnosis through effective communication -Adequate guidelines -Patients don't have influence regarding antibiotic prescription -Overall health can be influential for prescription -Doctors and patients have good relationships -Patients influence -Minimal improper us of antibiotics	Antibiotic prescription depends upon clinical knowledge and medical examination. Norwegian regulatory authorities have provided adequate antibiotics guidelines. Patients influence on decision to prescribe antibiotics and its effect on patientdoctor relationship. Antibiotic use is optimal with minimal antibiotic resistance with some exceptions in Norway.	Rational use of antibiotics through clinical examination and effective communication
2.	-Cultural differences regarding antibiotic use -Challenges of antibiotic resistance with travelers -A biggest cause of antibiotic resistance	Challenges with antibiotic prescription on people of immigrants' background	Antibiotic resistance and challenges related to optimal use of antibiotics and antibiotic prescription

	-Time consuming to handle immigrants background patients -Workload a constraining factor in following guidelines -Unnecessary prescribing due to lack of time	Antibiotic resistance challenges due to travelers Over prescribing due to work overload	

3.9 Data management:

Data management is very important in research considering ethical challenges. There were different software and tools used to collect, protect, proceed, and to store data in this study. Data is protected and stored in this study via Edu cloud. Edu cloud is a private cloud tool for academic research that was provided through Høgskolen I innlandet. Moreover, Netskjema is used to collect data regarding interviews, and collected data follows ethical considerations. Netskjema is sued in this study because data collected is a green data. Green data doesn't include sensitive information and the participants are not risk individuals according to ethical guidelines in Norway. Netskjema is password protected and it is in the University's protected data cloud. Dictaphone app was used to record interviews with participants consent, and then uploaded immediately on Edu cloud, that is a software provided by Høgskolen I innlandet to store data. Interviews were nicknamed and doesn't show any identification clues of participants.

3.10 Role as researcher:

Role of a researcher in all types of research project is very important. The researcher's motives, perspectives and preliminary hypothesis presented, and its effects are important for a researcher to consider (Malterud, 2001). My role as a researcher was to generate new

knowledge by conducting original research, surrounding Norwegian GPs experience regarding antibiotic prescription, use and resistance, based on a qualitative study design. I deal a lot of prescription including antibiotics on daily basis as a pharmacist and as cooperative partners in Norwegian health system I often contact with GPs to discuss different professional matters. I hear, listen and read from different sources about antibiotic use and antibiotic resistance on average daily basis as this is one of discussed topic in medical world now a days. My academic background thus, is related to pharmacy, pharmaceuticals, and medicines, and has a vital impact on collecting and interpreting the data. As a researcher it's a researcher role to present a theoretical framework, analyze, find, discuss and present the research data (Malterud, 2001). Identity of a researcher may affect the research process and its outcomes (Kerstetter, 2012). While performing this study through whole process of collection, interpretation, processing, transcribing, and making themes and codes as a researcher, I was fully involved, interested, curious but also aware of my position and role as a neutral researcher.

During the interviews, the interview guide was used to ask the questions to avoid the leading questions that could lead to biasness as insider, during the interviews, there were some deep discussions and terminologies that I could understand easily as health professional. It was also easy for participants to easily speak out about difficult medical terminologies considering that I can understand those medical terminologies. An outsider in research are valued for their objectivity "which permits the stranger to experience and deal even his close relationships by as though from a birds-eye view" (Kerstetter, 2012). As insider it is assumed that outsider researcher will never truly understand a culture or situation if they had not experienced it (Kerstetter, 2012). I am both a insider and a outsider in this research, I am a insider because I am working in Norwegian health system and I am outsider as a researcher of this study. As both an insider as a part of health system and outsider as a

researcher, I tried through critical analysis that, my academic background, knowledge, perspectives and believes do not affect the collection, analysis and interpretation of data. In this research my role was to put aside my personnel biases and affiliation and to conduct, collect, interpret, and interact with participants as a neutral researcher.

3.11 Research ethics

In research consent is a central ethical consideration using human participants and this process can be seen as a means of protecting and supporting autonomous decision making on the part of research participants (Sim & Waterfield, 2019). In this study consent form were handed over and signed by participants, prior to their agreement of participation in this project. In addition, it was associated principle of respect for research participants. This included the upholding of agreement and deletion of data. Participants were informed of their right to withdraw their participation without giving reasons and without consequences. Participants therefore had full authority over data both legally and ethically through a consent form. Consent may have some essential disclosure (adequacy of given information); comprehension (to which extent information Is understood by participant); competence (participants mental capacity to withstand agreement); and voluntariness) (Sim & Waterfield, 2019). I made sure that participants were informed adequately, they understood the information, their role, and responsibilities before conducting the interviews.

3.11.1 Confidentiality and anonymity:

In research project confidentiality is another important ethical aspect, and confidentiality relates to what would be done with provided information, and anonymity is also an important ethical consideration that attributes that, can participants be recognized by collected data or information they provide, or other details relating to them (Sim & Waterfield, 2019). In this project confidentiality was achieved by giving consent forms and to inform that information

are just for project purpose, and given information are safely stored and protected and will be deleted after the project. I as a student or my supervisor has access to given and collected information. The ethical challenge of anonymity was addressed by deleting the names of participants, and pseudo names were given in mentioned data.

3.11.2 Ethical clearance:

Ethical clearance was obtained for this study from SIKT. As SIKT is a Norwegian agency of education and research. Approval was taken 31/1/2024 under the reference number 259708 prior to very first interview was conducted.

#Chapter 4

Results :

This chapter is presenting the results of data analysis conducted for study on "Exploring the role and experiences of Norwegian general practitioners with antibiotic prescription". The key themes evolved from thematic analysis of conducted qualitative interviews include following two themes. The first being rational use of antibiotics due to effective measurements and implementations, and second is, antibiotic resistance and challenges related to optimal use of antibiotics and antibiotic prescription.

4.1 Theme 1: Rational use of antibiotics due to effective measurements and implementations

The data analysis involved thematic analysis of semi-structured interviews with Norwegian GPs to identify key themes and patterns related to Norwegian GPs experience with antibiotic prescription. The results present two themes and both of themes have sub-themes, theme 1. has 4 sub-themes and 2. theme has 3 sub-themes, the themes and sub-themes presented here

were to my best knowledge necessary to mention. The first theme revolves around available guidelines, grounds of prescribing antibiotics, patients influence and antibiotic resistance.

4.1.1 Sub-theme 1.1: *Norwegian regulatory authorities have provided adequate antibiotics guidelines.*

Among other experiences linked to different aspects, participants shared their experiences related to available antibiotic guidelines and Norwegian health regulatory authorities. The participants revealed that they have positive and encouraging experience with regulatory authorities and available guidelines related to regulation of antibiotic prescription and optimal use of antibiotics are enough in Norway. They also mentioned that they use health regulatory authorities' websites for their daily medical practice. The participants mentioned that available guidelines on antibiotic use are easy to access through health directorate and useful in daily practice. The available guidelines brief insight of different doses and type of antibiotic according to medical condition and diagnostic indication, as stated by Ivar:

"More than enough personally I feel that if we look at the (Healthdirectorate) website it is very, very easy to use. Very nice website to follow. It doesn't have a lot of information. It has the necessary information. It is concise. It is also updated. It is I feel the best source for getting antibiotic. It was proper antibiotic Indications. contraindications, doses. It also, the best part of what this tells the doctor website even tells you, like patients with needs like kidney failure. What can I think about? You should give what dose for children, if that interval is not going to work second and third, choice. And, if it's a chronic condition, what? So it gives a very, very good explanation. I, I'm very, very satisfied" (Ivar,2024).

Asher shared experience of medical practice that the available guidelines for optimal use of antibiotics are more than enough in Norway for him to handle patients clinically stated:

"Yes. The available guidelines are more than enough for our medical practice" (Asher, 2024).

The participants shared their experience and highlighted that available guidelines are enough to practice optimal use of antibiotics, guidelines are simple, clear, well written and it's a worthful source, also mentioned the website of health directorate as an example. Participant also suggested that there should be improvements in upgradation in those guidelines as stated by Addy:

*"You know, this is very individual. I do not know how my other colleagues prescribe. But if you ask, as I can only speak on my behalf, I feel the guidelines are very clear in Norway from given by the health directorate, and I think, and they are a source which we refer. And it's very well written there, and I feel fine. It could have been slightly better, but I think the use is okay, but sometimes I feel it may be, it may potentially be harmful, but it's very individual" (*Addy,2024).

4.1.2 Sub-theme 1.2: Prescription depending on clinical knowledge and medical examination.

In this study participants highlighted another key factor of importance on rational use of antibiotics. The most of participants prescribe antibiotics through clinical examinations and effective communication rather than the patients' expectations. The antibiotic is prescribed according to intensity of bacterial infection which is measured through different medical diagnostic techniques and different laboratory test of blood stated by Addy:

"We must see the patient, examine them, take some blood test, and see if it's viral or bacterial infection. Then we prescribe antibiotics" (Addy,2024).

Most of participants emphasized the importance of diagnosis through medical grounds and importance of explaining the medical facts through effective communication. Participants highlighted that explanation of not prescribing to patient is necessary. Participants believed that explanation between viral and bacterial infection and mentioning the other diagnostic results can give better understanding to patients that they don't need antibiotics as stated:

"I also explain to patients. My clinical examination. Sometimes patients come to me, and I tell them, you know, I have not heard anything in the lungs. Your lungs are completely fine. the blood tests are completely fine. You know what this is? Viral infection. You don't need antibiotics." (Ivar,2024).

The participants also explained that the antibiotic prescription decision is not based on patients influence and patients' expectations. Most of Participant mentioned that decision of prescribing antibiotics depends upon clinical knowledge and medical examinations. Jon highlighted the importance of medical findings for prescription and not according to patients' expectations and demand. The participant explained that it is important to differentiate between bacterial and viral infection to prescribe antibiotics and antibiotics are prescribed after the clinical evaluation of patient's health stated:

"I do not stand by my decision. I stand by myclinical knowledge and my clinical findings." (Jon,2024)

Marit revealed that decision of prescription is not self-assessed. The patient's overall health condition, medical examinations and overall evaluation of patients indication is driving factor of prescribing antibiotics stated:

"it's very rare that I decide myself. I do prescribe according to clinical evaluations." (Marit,2024).

Several participants mentioned the importance of right diagnosis in the response of questions regarding how they do prescribe antibiotic prescription. Furthermore, the participants shared their experience that how they have relationship with patients and does prescribing affects the relationship between patients and GPs.

4.1.3 Sub-theme 1.3 *Good doctor-patient relationship and it's not influenced by prescribing decision:*

A lot of participant shared that in Norway doctors and patients have generally good doctorpatient relationship and it's not affected by patients influence and their relation is not affected by prescribing and no-prescribing of antibiotics as stated by Zeg:

*" Antibiotics they use and after week, they become happy, and they have feelings so positive. So, we have a good relationship with the people and after because using the they use it antibiotics. But we have so control of the medication We don't want it to be to use it because his immunity for sure is good. But we have to write it because he's not good. And after three days, he used to come and say, I'm better. So, the person is looking so well in everything, but an infection is so high, but he have to use so long, we are aware to be addictive. we have good relation between the prescribing and not prescribing the medication with the patients" (*Zeg,2024).

Some of the participants revealed that one of the biggest influences that can affect the participants is intensity and overall health of patient, mentioning the parents who are desperate to take antibiotics as their children are sick and they want to get rid of that infection stated by Ivar:

"So, the influence, of course, the biggest influence is the condition of patient. I mean, they're usually when they come, they're always desperate because they are bad or the parents are very, very, very desperate because the children are sick" (Ivar,2024).

The participants were asked about the influence of patients for getting prescription, and participant named Asher, expressed that patients don't have influence on the participant, mentioned that if someone influences, participant will never prescribe stated:

"They don't have any influence. I will never prescribe anybody. If they ask me that they want to have antibiotic. I prescribe from my own knowledge and my Clinical rsults? Yeah." (Asher,2024).

The results of the data highlights that most of GPs have satisfactory relation with patients don't influence generally, but the patients condition may be a possible influence to prescribe antibiotics.

4.1.4 Sub-theme 1.4: ***Antibiotics use is optimal with minimal antibiotics resistance, having some exceptions in Norway***:

The participants shared their experiences related to antibiotic resistance and its impacts on Norwegian health system. The participants mentioned that restrictive prescribing of antibiotics, prescription of antibiotics are regulated and it's on medical condition, patients having viral infection can't be prescribed antibiotics. One of participant mentioned that antibiotic resistance is minimal stated by Zeg:

"Resistance. Yeah. Antibiotic resistance. in my opinion. You know, there is not too much in Norway. I don't think so" (Zeg,2024).

Jon mentioned that strict regulations of antibiotic prescription and optimal use of antibiotics in Norway are factors of low antibiotic resistance in comparison with another country stated:

"I would say minimal, because of the strict regulations. And you can't just get the antibiotic for the common cold. So, it's quite regulated. So, I would say there is minimal improper use of antibiotics" (Jon,2024).

Jon also compared low antibiotic resistance in comparison to another country describing that in access to antibiotics in other countries is common practice, but in Norway its wellregulated and that why Norway has minimal antibiotic resistance stated by Jon:

"I think it's a very prudent. I have worked in India, and there is a huge difference. so here in Norway guidelines are followed properly. you can't get antibiotics directly from the pharmacy. So there is a huge difference in that way" (Jon,2024).

The first theme of the results describes the enabling factors that help GPs to prescribe in proper way to prudent use of antibiotic regarding the different questions asked in interviews. The second theme now describes the different challenges that GPs face or different constraining factors that interrupt to prescribe and optimal use of antibiotics.

4.2 Theme 2: Antibiotic resistance and challenges related to optimal use of antibiotics and antibiotic prescription:

The second key theme that came out involves antibiotic resistance and increasing factors, challenges related to optimal use of antibiotics and antibiotic prescription and workload of participants which can affect the quality of health care service they are providing. The several participants mentioned that there is minimal antibiotic resistance in comparison with other countries and regulations related to antibiotics are followed by the participants at least. The participants further mentioned that there are some challenges that have, and can increase the antibiotic resistance in Norway. They also mentioned that people from other cultural and geographical back grounds can be challenging to handle as they have easy access of antibiotics in their respective countries in contrast to Norway, where antibiotic are prescribed after clinical diagnosis.

4.2.1 *Sub-theme 1. Challenges with antibiotic prescriptions on people of immigrant background*

The several participants of study emphasized a challenge related to immigrants, understanding of antibiotic prescription culture in Norway. They demonstrated that it was difficult for participants to explain that they prescribe antibiotics after a clinical evaluation and before they get a antibiotic prescription they will go through wait and watch technique. The participant uncovered that wait and watch prescription technique is new for many of patients from other cultural backgrounds. Aiza mentioned that it takes lot of time for her to explain to give information to patients with an immigrant background:

"Can I be very honest? I do have a variation of population patients here. ethnicity, I mean, So I do have problem with people outside of Norway. So, because they are very used to certain ways of prescription culture. When we suggest them to wait and watch as precautionary measure.so I need to explain a lot more and, use more time on this set of patients. but we do come to an agreement where I do not write it out just as I want." (Aiza,2024).

some of the participants also highlighted the challenge to deal patients with other cultural and geographical backgrounds, revealing that the patients from other countries residing in Norway are difficult to handle as they were used to take unnecessary antibiotic from their respective countries. The participant also mentioned that it is necessary to give extra information to those patients stated by Marit:

"I would say that those who have lived like, in a short period in Norway, they will demand the antibiotics. So, I think it depends. it is because of the way they have been treated in their respective countries and they have easy access to antibiotics, but it's also important to give them extra information that antibiotic is not the only cure" (Marit,2024).

Tor, expressed that it becomes difficult to explain the rules and regulations of antibiotic prescription in Norway to people who have not been living here for a long a time . The participant recommended to take a firm stand on medical diagnosis and not patients wish stated:

"Yeah. It becomes a little bit, difficult, but one must take a little bit firm stance. and it should be based on the medical condition and not just, on that the patient demands. So, one must be a little bit firm on the decision." (Tor,2024).

Ivar revealed that it sometimes become difficult to explain to patients from other origin because they think that whenever they are at doctors clinic they will always get a antibiotic

prescription. Ivar explained that this factor is important to counter-act for us, and they have to spend more time for such explanations stated by Ivar:

"Some patients from different cultural backgrounds, tend to believe that antibiotic is something they will usually get when they come to a doctor, or they will get medicines. And that's something we have to counteract. We must use more time to explain them" (Ivar,2024*).*

The one of challenges that most of participants expressed was the patients from immigrant backgrounds. They expressed that the immigrants were not used to follow the rules and procedures of prescription culture in Norway, and that's why it takes lot of time to explain them. Another challenge that most of participants revealed was antibiotics resistance related to travellers.

4.2.2 *Sub-theme 2.2: Challenge of antibiotic resistance with Norwegian travelers:*

Some participants associated antibiotic resistance with Norwegian travellers in and out of country. Several participants reported that thousands of Norwegian travellers travel to different countries and reside there for short and long time, and in some of countries the use of antibiotics is not optimal, and patients access to antibiotics is easy. Participants such as Zeg, believed that patients travelling out and come back with multi resistant infections, and that they can be very difficult to treat::

*"I think the biggest if it's antibiotic resistance we're talking about if patients who are going out and traveling abroad, one of them. Okay one of the things we see is people traveling outside, they usually come back with MRSA, for example, MRSA, multi resistant infections, which are hard to treat"(*Zeg,2024).

Tor mentioned a same phenomenon that they sometimes compromise and prescribe antibiotic to travellers in cases of bacterial infection that may lead to oversubscription. However, Tor revealed rarely do they of the time compromise on prescribing antibiotics unless they are extreme cases usually involving travellers:

"Mostly we do not compromise. But sometimes we may compromise. Let's say, elderly lady who is traveling to Spain for one month and planning to bath and such. Then you have a recipe to get a urinary tract infection. And she said, oh, it's so stressful to seek the doctor there just to get the antibiotic treatment. So, I make sometimes compromise for benefit for the patient's well-being sometimes. But very seldom, very seldom" (Tor,2024).

Several participants mentioned that travellers that travel abroad and live there for longer periods and then comeback are one of reasons of antibiotic resistance in Norway. Marit mentioned that in Norway everything is documented, and doctors know the patient's history and patients have better follow-ups. However, patients using antibiotics and having bacterial infections are not documented due to patients residing in another country on vacation. Participants reveal that this may increase antibiotic resistance in patients stated:

"I actually think that patients who live here in Norway but are on holiday abroad and are on a longterm holiday when they use antibiotics there and come back, then they are more resistant than actually here in Norway, because here you have control in a way that everything is recorded. And that because even if you test for, for example, if you have several resistant because now you have been on several courses, but the antibiotics do not help. Urinary tract infections during the year, you send it in for culture and say okay, you are Maybe you need a different type of antibiotic. So, we check things like that, sort of write down the name of resistance" (Marit,2024).

Most of the participants revealed different challenges regarding antibiotic resistance and unnecessary prescription including challenges related to immigrants and travellers. Another challenge that almost all the participants shared was about overall job-burden. Due to high

patients count and waiting list they prescribe sometimes unnecessary. They mentioned that they also face time management challenge because they have to cooperate with other health and social institutes, and it takes a lot of time, and it increases the job-burden which can affect quality of health provided.

4.2.3 *Sub-theme 2.2: Unnecessary antibiotic prescription due to patient-burden:*

The participants revealed the challenges related work overload mentioning that for GPs in Norway there is much to do and there are different working job-related protocols and procedures that are time consuming and difficult to follow. Asher mentioned the extra working hours to fulfil job requirements stated:

"I start every day, like, 8:00 and, and try to finish 3:00, but, never come home before 4:00" (Asher,2024).

Addy, highlighted the challenge of following guidelines and find the time to read different guidelines to update their knowledge on regular basis. Jon also expressed, using extra hours to read and follow different available guidelines as stated:

"high workload there are different guidelines and procedures we have to follow. So, it could be challenging. Challenging to be up to date. so, many more extra hours on reading." (Addy,2024).

Majority of participants mentioned that overload of patients is one of challenge that can drive a prescriber to over or unnecessary prescription of antibiotics. Several participants also described that due to longer patient waiting it is sometime challenging to follow guidelines and if they have long waited list, they just prescribe antibiotic. Jon, mentioned that treating multiple resistance and complex infections become a challenge to treat sometime due to overload of patients stated:

"I think the patient load sometimes, there are patients who are waiting. So instead of, telling the patient, on the right time. we just prescribe antibiotics. Most of the time, this is because of overload of patients. And sometimes we find, hard to treat infections. So multiple resistance or resistant bacteria. So, yeah, these are the Challenges (Jon,2024).

All of participants revealed that job of GPs is multi directional and due to parallel working and sharing of different necessary information to other health and social care institutes, the burden of working increases on GPs stated:

"My work primarily revolves around patients Coming to us for general problems, but also preventive care and Acute problems. it also revolves around working with other institutions, social care services, hospitals, home care centres, pharmacies. So, there's a lot of work to do for us" (Ivar,2024).

The qualitative analysis of this study explored the experiences of Norwegian general practitioners for antibiotic prescription and the experience of participants had a positive corelation. The qualitative interviews revealed several key themes related to experience of Norwegian GPs regarding antibiotic prescription including professional stress and job-related challenges, rational use of antibiotics through clinical diagnosis and effective communication. Moreover, Challenges related to promotion of optimal use of antibiotics to people from different cultural and geographical backgrounds, challenge of antibiotic resistance with Norwegian travellers were imminent. In addition, Norwegian regulatory authorities have provided adequate antibiotics guidelines and Antibiotic use is optimal with minimal antibiotic resistance, these are some of the key findings of this study. These findings uncovered the diversity of experiences of participants related to antibiotic prescription, revealing that participants had positive experiences with patients, antibiotic use and prescription and also with regulatory authorities in Norway. The corelation between antibiotic use and prescription and regulatory authorities is satisfactory. The corelation between the experiences of

participants regarding use of antibiotics and prescribing antibiotics on medical conditions and diagnostic indications support the hypothesis that optimal use of antibiotics and antibiotic prescription can contain the antibiotic resistance in Norway.

The findings of this study have valuable suggestion to continue better use of antibiotics and continued efforts to restrict antibiotics resistance. By mentioning, better health outcomes due to restrictive use of antibiotics, availability, and implementation of antibiotics guidelines, better control on antibiotic prescription, this research project supports the optimal use of antibiotics to attain substantial health benefits. The findings of this research highlights important insights of experiences of Norwegian GPs on antibiotic prescription. This study provides a detailed understanding of Norwegian GPs experiences, their patient handling, and their dealing with health regulatory authorities regarding antibiotic prescription. The different key themes of this research study can help to explore the new ways on vast increasing research on antibiotics use and antibiotic resistance in medical field.

The findings in this research project provide several key themes in exploring different new boundaries of topic regarding Norwegian GPs experience in antibiotic prescription. The identification of different themes is describing the different point of views of participants regrading research question. Key findings of data in this research manifests different challenges of GPs, patients, and regulatory authorities. These findings provide a brief overview to understand the mechanism of getting an antibiotic prescription from a GP, use of antibiotics, influence of patients, GPs decision of prescribing antibiotics and regulatory authorities requirements of controlling antibiotic resistance. The key themes of this study can give direction to policy making authorities to control existed and upcoming irrational use, consequently antibiotic resistance, while addressing concerns of Norwegian GPs of high workload on job and more closed working relationship with regulatory authorities.

Chapter 5

Discussion :

The aim of the study was to explore the experience of Norwegian GPs regarding antibiotic prescription and antibiotic use. This chapter entails the discussion of main themes in context of the literature review, theory, research question and philosophical and epistemological perspective presented in previous chapters. This chapter also outlines discussion of main themes, suggestions and recommendations, implications for future research and limitations of this research project, and also conclusion of the study.

The analysis of data highlighted a lot of positive co-relation in experiences of participants including prudent use of antibiotics in Norway, adequate available antibiotics guidelines, good patient-doctor relation, decision of prescription based on clinical findings, and a positive working relationship with health regulatory authorities. It is also important to mention that other factors like workload, unnecessary prescription due to job-stress and travellers related challenges, overall health condition, required improvement in available guidelines and patients from other culture and backgrounds are also considerable to explore the other contra experiences of participants. In future research these factors can be searched to explore the depth of these factors to get a better level of understanding of their role in antibiotics use, prescription, and antibiotic resistance in Norway. There are some enabling and constraining factors which give an insight of what are helping factors to prescribe antibiotics following guidelines, and constraining factors which may interrupt optimal use of antibiotics in Norway.

Figure 1: Constarining and facilitating factors of GPs work

	Challenges related with patients from other cultures	Prudent use of antibiotics	
Constraining Factors	Antibiotic resistance due to travelers	High patients awareness	Facilitating factors
	Non-flexible guidelines	Low prevalence of antibiotic resistance	
	Antibiotic resistance associated with multi resistant infections=MRSA	Reporting system for antibiotic resistance	
	Lack of communication between GPs and health regulatory authorities	Adequate guidelines to facilitate antibiotics	
	Lack of monitoring of GPs prescription	Support from health authorities	
	Patients influence	State regulated GPs facility	
	Negative patients compliance regarding antibiotics prescription	International coordination towards	
		better antibiotics health outcomes	

Discussion of key themes:

5.1.1 Rational use of antibiotics due to effective measurements and implementations:

The findings from GPs experience show that overall use of antibiotics and prevalence of antibiotic use in Norway is optimal. Kristiansen found that antibiotic resistance is linked with high number of usage of antibiotics (Kristiansen et al., 2001), but this may not be the case in Norway due to several reasons. The findings of this study corelate positively with findings of Haug et., al (2011) who noted that Norway has modest use of antibiotics and therefore prevalence of antibiotics resistance is lower as compared to other European countries (Haug et al., 2011). Waaseth et.,al (2019) related this low prevalence of antibiotic resistance with high levels of knowledge and understanding of antibiotics by ordinary Norwegians (Waaseth et al., 2019). In this perspective existed literature and findings of this study have same point of view of optimal use of antibiotics and low prevalence of antibiotic resistance.

The results of this study revealed that there is minimal misuse or overuse of antibiotics, consequently low prevalence of antibiotic resistance in Norway. This study found that antibiotic resistance can have drastic health impacts but still it's not a big challenge in Norwegian health system. Mancuso et.,el (2021) discovered that misuse or overuse of antibiotics has increased the antibiotic resistance in recent decades that has a negative impact on public health and health systems globally (Mancuso et al., 2021). The findings of this study describe that prescriptions are prescribed according to medical condition and clinical examinations, not on patients demands, which has positive correspondence with existed literature, according to Steinman findings antibiotics are prescribed considering medical indications and clinical examinations and not on patients influence (Steinman et al., 2003).

The findings mentioned that its necessary to inform the patients through effective communication and clinical findings that whether they need an antibiotic prescription or not. The GPs take help by physical examinations, lab tests and overall health conditions to make a sure evaluation of appropriate diagnosis and to avoid unnecessary antibiotic use in their patients. The study also explained that there is a whole process of diagnosis of bacterial infection and prescription of antibiotics in Norway, which makes it easy to evaluate whether it's necessary to prescribe antibiotics or patients don't need antibiotics or as a precautionary measure patient should "wait and watch" before using antibiotics. The findings of this study are like what mentioned in existed literature regarding clinical diagnosis and medical conditions to prescribe antibiotics. But on other side, while most of GPs in other countries struggle to describe differences between bacterial and viral infections (Hulscher et al., 2010). Norwegian GPs generally decide to prescribe through physical and medical findings to add up prudent use of antibiotics in Norway according to findings.

The findings of this study showed another facilitating factor for optimal us of antibiotics and antibiotic prescription, which is related to available guidelines for prescribing antibiotics in Norway. This study found, GPs satisfaction regarding availability of guidelines and support of health authorities to enable a good medical practice for GPs. The key themes mentioned that guidelines are enough, useful, and clear to prescribe antibiotics, and they get help from those guidelines on daily basis while prescribing antibiotics. The availability of clear and enough guidelines enables GPs to follow and adhere to guidelines while prescribing antibiotics. In contrast existed literature uncovered that antibiotics prescription are not according to guidelines in USA and Canada (Mercer, 2019)., This could be because the health systems of those countries are not same as Norwegian health system and multiple other factors are involved in clinical practice and prescribing culture in those countries.

The findings of this study also demonstrate that GPs follow the guidelines and sometimes suggest patients to read those guidelines for better use of antibiotics and patients' education. The results show GPs general satisfaction with the existing antibiotic prescription guidelines in Norway, while others suggested improvements and flexibility in guidelines for smooth practice. According to Colliers findings in Belgium, General practitioners prescribe most antibiotic prescription and sometimes they don't follow recommended guidelines (Colliers et al., 2020). Norwegian GPs are satisfied with available guidelines and they do follow, and some of participants suggested that there should be course work and educational seminars for better cooperation between GPs and health regulatory authorities.

The findings of this study are similar with Mercer that GPs are first line health care provider and prescribe the most antibiotic prescription (Mercer, 2019). However, the findings of this study have contrast with Mercer findings in the regard of patients influence. In this study findings reveal that Norwegian GPs prescribe according to their clinical knowledge and medical examination rather than patients demand or influence. While the results of Ashworth et.,el (2016) revealed that patient-doctor relation can be affected, if GPs are not supposed to prescribe antibiotics on patients demand (Ashworth et al., 2016). The antibiotic prescription depends upon whether a patient pays or not (Murphy et al., 2011). In contrast to findings of Murphy et.,el (2011) and Ashworth et.,el (2016) in Norway, health system is mainly state regulated that's why other factors like financial interests are mainly not involved. The findings depict that GPs decisions on antibiotic prescriptions is influenced more by the guidelines and medical knowledge than the patients. According to finding of this research patient don't have any influence on GPs to get a prescription. This study also found that there is satisfactory patient-doctor relationship. There may be different factors that enable positive doctor-patient relationship including, state regulated health system, no financial incentives, trust level values and patients own knowledge. Norwegians knowledge regarding antibiotics use and antibiotics

is generally high (Waaseth et al., 2019). The findings express that in the situations of disagreement, Norwegian GPs communicate effectively with their clients to explain and suggest precautionary measures before antibiotics use.

The findings of this research elaborate that evaluation of overall health of patients matters in antibiotic prescribing decision. The study also found that despite of bacterial infections in some patients, GPs don't prescribe because of better immunity and better overall health to avoid use of antibiotics. The antibiotics are prescribed according to diagnostic indications and not on the expectations or demands of costumers. Whereas, Cole found that GPs get pressurized by patients while prescribing antibiotics and they prescribe even its not necessary in UK (Cole, 2014). Whereas, in Norway the GPs are not influenced by patients demand and they handle it with clinical findings. In this context, contrary to research in other countries, Norwegian GPs are not influenced by patients for prescribing antibiotic prescription.

The findings reaffirm the argument that following the recommended guidelines for antibiotic use may reduce over prescription and risk of antibiotic resistance. In contrast to findings of this research, antibiotic resistance is increasing and it has negative consequence on health system in UK (Llor & Bjerrum, 2014a). According to world health organization antibiotic resistance antibiotic resistance was responsible for 1,27 million directly and 4.95 million in-directly in 2019 (WHO, 2021). On contrary, the findings in Norwegian context reveal a mix response form participants, as most of participants expressed that they have not experienced antibiotic resistance here, while some mentioned that antibiotic resistance is a problem in Norway and can affect Norwegian health system in upcoming years. The diversity of findings may be due to different patients groups, age groups and area of practice.

Appropriate medical practice, follow-ups from health authorities, access to patients history and patients education may be the possible factors related to use of antibiotics in optimal way, and low prevalence of antibiotic resistance in Norway. The findings of the study show that

availability of antibiotics for patients is just through prescription in compared to some other countries where its easy access to antibiotics for patients. The aim of national strategy of antibiotics use is to reduce the use of antibiotics by 30% per inhabitant (Helsedirektoratet, 2019). The findings of the study have positive relevance with health directorate in this regard as GPs in Norway are practicing possibly appropriately to make it happen to reduce unnecessary or overuse of antibiotics.

5.1.2 Antibiotic resistance and challenges related to optimal use of antibiotics and antibiotic prescription.

The findings show different challenges that interrupt optimal use of antibiotics in Norway. The findings of this study expressed that GPs have a positive experience with their patients, but the patients from different backgrounds can be difficult to handle. This could be a challenge in optimal use of antibiotics in Norway. The participants highlighted that meeting patients from immigrant backgrounds were sometimes challenging to handle because they were not used to follow different evaluating factors for prescribing antibiotics. The possible reasons for this challenge may be the quality of health system in respective countries, competency difference of GPs, and patients knowledge about antibiotics. However, patients experience may be explored in future studies to explore these possible questions. As Hawkingset.,el (2007) found, people are being engaged in efforts to control antibiotic resistance because they can generally play a positive role in containing the use and antibiotic resistance (Hawkings et al., 2007). That's why it is important to educate community, so that ordinary people can play a positive role in reducing antibiotics over use and minimizing antibiotic resistance. The finding of this study also have positive relevance with the study mentioning that, less use of antibiotics means low antibiotic resistance (Llor & Bjerrum, 2014a). Thus, findings describe that different precautionary measures are taken consistently

before prescription like “wait and watch” prescription, to sure right diagnosis and right use of antibiotics and to avoid possible unnecessary use of antibiotics.

Most participants associated antibiotic resistance in Norway to international travelling and use of health care services abroad. Participants shared that a lot of patients when stay in those countries and come back they may have developed antibiotic resistance. The findings of the study shows that, those patients especially have developed multi resistant infections (MRSA), which is very hard to treat (Forsberg, 2017), requires a lot of resources and increases burden on Norwegian health systems. Antibiotic resistance is a global health problem and many countries have irrational use of antibiotics including European countries (Machowska & Stålsby Lundborg, 2019). Supporting the findings of Machowska and Lundborg, this study also found that when Norwegians travel and live in other countries they also develop antibiotic resistance, possibly due to flexible regulations in getting antibiotic prescription. In this way the existed studies and Norwegian GPs have positive correlation, mentioning the negative health impacts of antibiotic resistance in communities. On the contrary, the Norwegian GPs mentioned particularly “travelers resistance” which is not mentioned in previous research.

The few of participants also mentioned another aspect of “compromising antibiotics prescription” that is, they prescribe antibiotics to some of patients who are travelling to certain countries on vacations and may be get a bacterial infection. This may be one of the forms of over or unnecessary prescribing practice. The different studies presented in literature review also highlight that over prescription increase antibiotic resistance further increases morbidity and mortality, antibiotic resistance increase financial burden on health systems (Dadgostar, 2019; Porco et al., 2012). In this context, the existed studies and this study same point of view mentioning the antibiotic resistance is a burden on health system. On the other

hand, the findings of this study highlight that GPs sometime over-prescribe due to travelling causes, traveling patients without existed bacterial infections.

The findings highlighted that due to over-load of patients and long waiting list they sometime prescribe antibiotics without proper medical diagnosis due to lack of time. Lack of time and patients burden is was also reported in UK according to findings of Rose et.,el (2021) as one of reasons of antibiotic resistance (Rose et al., 2021) As findings of BJörkman et., el(2011) minimize antibiotic resistance its mandatory to prescribe appropriately (Björkman et al., 2011). The findings of the study disclosed one of the reasons of somehow improper use of antibiotics in Norway is huge workload on Norwegian GPs. The reasons for overload on GPs is due to their cooperation with other medical and social institutions including, hospital, nursing homes and Nav. One of causes of antibiotics resistance in Norway is high work burden on GPs, because due to lack of time they are sometimes unable to make proper diagnosis and chances of mistakes or improper uses are imminent, and that has similarity with existed studies where GPs mentioned that lack of time and patients burden (Cole, 2014), is one of reasons of improper diagnosis of bacterial infections.

In conclusion, this study has provided a deep insight of experiences of Norwegian GPs regarding antibiotics use and antibiotic prescription. There were lot of similarities to already existed studies and on other side there were lot of findings that were in contrast to existed studies. There was a consensus of experiences, where both participants of existed studies and participants of this study described the importance of antibiotics, their uses in medical field, importance of proper diagnosis, and optimal use of antibiotics. There were also different types of experiences from previous studies and this study, antibiotic resistance in Norway isn't imminent, available guidelines are enough, following prescribing guidelines, no patients influence, and no financial interests are involved according Norwegian GPs, but these factors are considerable in previous studies. Antibiotic resistance associated with travelers and in

patients with immigrants backgrounds, and high workload on GPs are new findings of this study which are not mentioned in literature presented,

5.1.3 Theory of power and key findings:

The findings of this study are analyzed by using the theory of power, as these findings entails a complex power sharing between the GPs, patients and regulatory authorities. The GPs interaction with both patients and regulatory authorities are points of power sharing, and power constraining in this study. This reserch found that Power is distributed between patients, GPs and health authorities in Norway which make it complex, and neither patients nor GPs and health authorities can influence each other. In contrast to findings of Rhodes et.,el (2007) doctor-patients relationship traditionally percepts that doctors have more power when interact with patients due to professional knowledge (Rhodes, 2007). GPs interaction is positive and there is not a stretch of power between doctors and patients according to findings. Taking from the Foucault's power relation, we observe that doctors are prescribing authority and have substantial professional and medical knowledge (Lorenzini et al., 2013). Norwegian people have a good level of understanding of antibiotics and they are also aware of health system working mechanism, and that's why they may interact with GPs with equal level and are free to express their meaning, point of views and disagreements.

The GPs have prescribing authority , while patients wield power through their autonomy and preferences, and in this way patients expectations influenced by social norms and consumer advertisement shapes, doctors prescribing decisions, which leads nuanced negotiation of power within clinical interactions (Rhodes, 2007). According to all participants there is no power constrain between patients and doctors in Norway, neither doctors nor patients have any power and influence on each other. This study also found that GPs communicate effectively with their patients if GPs are not supposed to prescribe, and explain

the reasons briefly, proving by clinical tests that why respective patients don't need a prescription. This may be a good reason of the reported satisfactory relationship between patients and GPs in Norway. The study also revealed that if patients are not agreed with GPs after all discussions and clinical evaluation, so GPs refer the patients to another GPs or specialist for new evaluation, in this way patients are free to discuss their disagreements with GPs making them feasibly equal power sharing authority as GPs self.

It is also a general perception that regulatory authorities influence the prescribing monster of doctors through guidelines. Doctors navigate these problems, and it can both empower or constrain their prescribing practices. Our findings highlight how regulatory authorities impact on prescribing of antibiotics on Norwegian GPs by taking the help of Rhodes` conceptualization of governance (Rhodes, 2007). Medical boards, government agencies, pharmaceutical regulations impose standard and protocols that guide doctors to prescribe, while such regulations drive doctors to safe and effective prescribing, they also introduce challenges by limiting doctors autonomy and discretion (Rhodes, 2007). In this context our findings reveal a positive and enabling relationship with regulatory authorities. Most of findings reveal satisfactory relation with their regulatory authorities, highlighting that regulatory authorities enable them to effective and safe prescribing practice. The regulatory authorities have provided enough and resourceful guidelines, and those authorities don't constrain power on GPs according to participants. The health regulatory authorities can only provide guidelines, recommend interventions, educate health professionals and make health policy, however, GPs are free to take an independent decision on clinical practice and prescribing decision. According to findings neither, regulatory authorities can force GPs to prescribe considering their recommended guidelines, nor patients can influence to get a prescription according to their expectation, while GPs hold the obligation of quality of health service to patients and are supposed to follow recommended guidelines. Those factors can be

possible reasons of balance of power in both patients, GPs, and regulatory authorities in Norway.

5.1.4 Recommendations for interventions and policy making:

Based on the discussion of key findings of this study and reviews here are some recommendations for optimal use of antibiotics and improved public health outcomes.

- GPs workload and patient burden should decrease, so that they have enough time to diagnose and communicate properly to find appropriate indication and may prescribe appropriate antibiotic course to their patients.
- Number of GPs in municipalities should be increased for enhanced health coverage and reducing patients' number per GP.
- Encourage GPs for thorough assessments to find the route cause and different factors associated with prevention of bacterial infections.
- GPs should practice mandatory precautionary measure before prescribing antibiotics to contain unnecessary use of antibiotics in society.
- Patients' awareness should be enhanced continuously on the increasing issues of antibiotic resistance through different channels using health institutions websites, public service messages, awareness walks and electronic medias.
- Regular updates are recommended to provide most appropriate guidelines to prescribe antibiotics for advancement and interventions in treatment courses.
- Regular seminars and workshops should be arranged to provide interactions opportunities to both GPs and health authorities personnel, so they can share different ideas, suggestions, and possible interventions to limit antibiotic resistance.

These recommendations can facilitate the working mechanism of GPs in Norway to perform their professional duties to their maximum capacity. The proposed interventions can

enable GPs to provide approximate health service to their patients and facilitate better health outcomes in Norway. Through these recommendations patients can get better awareness of antibiotic resistance. By considering these recommendations health regulatory authorities can enhance the quality of their policy making, cooperation, proposals, and a way forward to perform even better towards appropriate antibiotic use.

5.1.5 Implications of study

The findings of this study have significant implications for various stakeholders of health system. The key finding provides a brief insight of Norwegian GPs experience in context of antibiotic prescription and antibiotic use. These insights provide prescribing patterns, approach, and challenges regarding medical practice. The knowledge from the study can help in development of different intervention for patients' safety, better prescribing practices, and optimizing treatment outcomes. The results can highlight health care provider and patients' interactions surrounding antibiotics prescription and proposes GPs collaboration with patients for decision making in antibiotic prescription mechanism. The findings from study can have considerable impacts on medical education by describing the importance of professional training for GPs in antibiotics related medical practice. Incorporation of antibiotic related training can equip GPs for future endeavors regarding antibiotics use, prescription and different educational skills to manage antibiotics in a responsible way.

This study may help in advancements of antibiotic guidelines and may help policy makers to review their policies. The experiences of Norwegian GPs provide a ground where regulatory authorities can provide statistics based recommendations and prescribing protocols for safe use, appropriate prescription and reducing risk factors associated with antibiotics misuse or overuse. The identification of gaps can open the new ways of research initiatives in antibiotics from different perspectives. The new research initiatives can be effectiveness of

precautionary measures, alternative treatment options, long term impacts of antibiotics use, patients experience regarding antibiotics use and prescription. It would be very interesting to explore the experiences of patients for getting antibiotics prescription and antibiotics use. The understandings of GPs experiences can advance public health strategies to improvise the strategies according to focus groups, screening process and a lead towards evidence-based treatment managements. Thus, antibiotics use can have extensive public health implications including treatment effectiveness, better health outcomes and patients' well-being.

Future research can explore different aspect of key findings of this study e.g. work-life balance of GPs, prevalence and measurement of antibiotic resistance, specific interventions to control antibiotics use and exploring of complexity of doctor-patient relationship. The findings of the study demonstrated the experience of Norwegian GPs and their handling with patients expectations, while adhering to antibiotic prescription guidelines provided by health regulatory authorities. By considering the better workload management GPs, controlling numbers of prescriptions, following precautionary measures before prescription, patients education on antibiotics use and resistance and better follow-up from regulatory authorities of GPs can help to prudent use of antibiotics and can help to contain antibiotic resistance in Norway.

5.2 Limitations of study:

The qualitative interviews to explore Norwegian GPs has provided a substantial qualitative data, but this method has some limitations like most of the other methods have. First of all, the description of participants, The GPs who have both positive and negative experiences can be more feasible to share their experience with interviewer, and that can affect different point of views and biased data, that is not an average experience of medical professionals

(Kvale & Brinkmann, 2009). Another limiting factor of qualitative interviews is that participants feel uncomfortable while sharing sensitive information, personnel details and experiences due to concern about confidentiality (Bryman, 2012). In addition qualitative interviews may not address the whole diversity or complexity of participants experiences, and interview guide can drive participants to a narrow prospect where they are not fully able to disclose their experiences (Bryman, 2012). By considering these factors one can assume that the collected data is somehow is not the average of all GPs in Norway.

The characteristics of participants may have affected the key findings to explore the experiences of GPs. Secondly, Another limitations of study was sampling, the problem of sampling is always present and it is difficult to recruit required number of potential participants (Oppong, 2013). There were 12 potential participants recruited, but due to busy job-schedules and some personnel commitments, only 8 were interviewed. Another limitation of this study is gender distribution of interviewed GPs, as it was aimed to recruit as equal as possible numbers of equal participants by gender, but 6 of participants are males and 2 of participants are female which may also have affected the results.

Moreover, the interviews in this study are performed in English whereas all the participants speak Norwegian language, but participants were free to answer in Norwegian or English and this possible limitation may also have affected the diversity of expression. In addition, some interview questions were answered in Norwegian then translated into English which may have affected the results. Furthermore, another limitation of this study can be analysis of data through thematic analysis for a first-time researcher due to lack of experience may affected the results. The interpretations of results and discussion of key findings may also affected the results due to educational background and unintentional biasness of researcher and it can also be a considerable limitation of this research project.

5.3 Conclusion:

The aim of the study was to explore the experience of Norwegian GPs with antibiotics prescription and antibiotics use. This study has explored diverse experience of Norwegian GPs regarding antibiotic prescription, interaction with patients and interaction with health regulatory authorities in Norway. Through qualitative interviews and thematic analysis, several significant themes surfaced, encompassing the rational use of antibiotics, antibioticprescription based on clinical investigation, adequacy of antibiotic guidelines, and challenges faced by GPs concerning immigrants, travelers, and job roles. The findings show that there is optimal use of antibiotics in Norway, with adequate available prescribing guidelines. GPs experience with patients and regulatory authorities is positive that enable them to take prescribing decision on clinical grounds and patients influence is not experienced by GPs to get antibiotic prescription. However, there are also some challenges that are related with antibiotic resistance and unnecessary use of antibiotics. Travelers that use antibiotics in other countries, patients from immigrant backgrounds take lot of time to explain and job overload of GPs are some of challenges that are possible causes of increasing antibiotic resistance and unnecessary use of antibiotics in Norway. By addressing these challenges continued prudent use of antibiotics can be attained to get better health outcomes in this regard. The key findings from this study hold potential implications for patients compliance, clinical practice, and health policy. Moreover, by taking into account and comprehending the valuable experiences and diverse perspectives of GPs, health policymakers can devise multiple interventions and regulations that empower GPs to deliver higher-quality healthcare to their patients concerning antibiotics. Moreover, it is important to mention different limitations of study including, characteristics of participants, small sample count, language, and lack of experience in analyzing data by researcher. Furthermore, by acknowledging these study limitations, future research can aim to address these constraints

and delve further into investigating the intricate dynamics associated with antibiotics use and antibiotic prescription. In conclusion, this research project adds to evolving literature on GPs experience concerning antibiotics use and prescription, thereby encouraging further investigation into this topic and its related aspects.

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Appendices:

Appendix A:

Interview guide

Check list before interview:

- Signed consent form
- Voluntary
- Introduction
- Thanx for participation

Background Information:

- Age
- Sex
- Job title
- How long have you been working as general practitioner:
- How long you have been working in this area/part:
- Have you worked on different position rather than general practitioner:
- Do u have any specialization:
- Have you worked in other parts of country as GP:

Questions:

A: Role as general practitioner and experience:

- How do you describe working as a general practitioner in Norway?

- What are your job description and important tasks, and how do you describe your role in Norwegian health system

- How is your experience with patients generally?

- What does motivate you to work as general practitioner in Norway?

- What does motivate you to work as general practitioner in Norway?

- What challenges a GP face while working in Norway?

- Have you worked outside of Norway as GP ?

B: Experience of antibiotic use in Norway

- How do you describe antibiotics use and prescription in Norway?
- Do you think the use of antibiotics is somehow improper in Norway?
- Could you explain how patients get information on the right use of antibiotics in Norway?
- What has been the impact of antibiotic use in Norway?
- Could you describe, if any, challenges related to antibiotic resistance in Norway?
- What are some of the causes of antibiotic resistance in Norway in your opinion?
- What impact do you think antibiotics resistance can potentially have to the Norwegian health system in upcoming years?

C: Experience with their patients on antibiotics use

- How would you describe your experience with antibiotics prescriptions?
- How would you describe experience of your patients with antibiotics use?
- What influence do your patients have on getting the prescription and how does that influence your decisions on prescriptions?
- How Do you inform your patients about proper use of antibiotics?
- Describing from experience, how has antibiotic prescription impacted the doctor-patient relationship between you and your clients/patients?
- In your experience, how do you deal with situations on prescribing antibiotics when patients demand for it?

- How do you deal clinically to patients when you are not supposed to prescribe Antibiotics?

- Could you describe how aware your patients are/ about antibiotic resistance.

- What influence do your patients have on getting the prescription and;…..how does that influence your decisions on prescriptions/prescribing antibiotics to patients?

D: Experiences with regulatory authorities/government

- How is your experience with regulatory authorities on antibiotic prescription and use?

- How do you describe your co-operation with regulatory authorities to provide information about antibiotics use?

- What is your opinion on the available guidelines, are those guidelines enough to ensure the right and safe use of antibiotic?

- What do you think needs to be done to improve your working relationships with Regulatory authorities on the use of antibiotic moving forward?

- What role do you think general practitioners can play in the implementation? and adhering to the prescription guidelines?

- Is that anything you want to contribute that was not asked?

E:

- Is that anything you want to contribute ?

Appendix B

Consent Form

Are you interested in taking part in the research project

"Exploring the role and experiences of Norwegian General Practitioners with antibiotic prescriptions."

A qualitative study

Purpose of the project

This is a project of master study of master's in public health in Høgskolen I innlandet. The main purpose of this study is to understand the experience of Norwegian general practitioners while prescribing antibiotics in patients, in adherence with guidelines for prescribing antibiotics. This project aims to understand handling of GPs in Norway while prescribing antibiotics. In addition, this project will provide better understanding of increasing antibiotics resistance and use of antibiotics in Norway.

Which institution is responsible for the research project?

Høgskolen I innlandet

Why are you being asked to participate?

You are being asked to participate in project because you fulfil criteria of this project. This project wants to know the experience of Norwegian General Practioners (GPs) in antibiotics prescription who have been working in Norway for at least last 3 years. This study aims to include GPs in Elverum.

What does participation involve for you?

This master project requires a interview from participants that is between 30-60 minutes. Interview is normal discussion according to interview questions between participant and host. De questions that will be asked to are relevant to your experience as GP, Challenges related to your post and challenges related to prescription of antibiotics, including influence of patients for prescription and how you keep a balance between doctor-patient relationship while adhering antibiotics guidelines. In this regard som background information would be collected for example, age, gender, job experience years and job designation. Interview can

be conducted face to face or on telephone or zoom, and this interview would be recorded in interviewers telephone and information will be directly saved and just interviewer would have access to it.

Participation is voluntary:

Participation in the project is voluntary. If you chose to participate, you can withdraw your consent at any time without giving a reason. All information about you will then be made anonymous. There will be no negative consequences for you if you chose not to participate or later decide to withdraw.

Your personal privacy – how we will store and use your personal data
We will only use your personal data for the purpose(s) specified here and we will process your personal data in accordance with data protection legislation (the GDPR).

- All information that will be gathered before during and after interview will be stored safely and me as a student and my co-supervisor Archlove Takunda Tanyanyiwa and my supervisor victor chimhutu as all information are anonyms as well.
- All information like name, contact information that can identify you would be saved in system of Høgslone I innlandet by using the services of "Services for sensitive data".After interview it would not be possible to recognise the person from the information that has been given in interview.

What will happen to your personal data at the end of the research project?

The planned end date of the project is 10 June 2024 and interviews, and information will be deleted after project ends. All gathered data will be deleted after 6 months (January 2025) of project ending as per the demand of Høgskolen innlandet. So, there is proof to show that the research has taken place.

Your rights:

So long as you can be identified in the collected data, you have the right to:

- access the personal data that is being processed about you
- request that your personal data is deleted
- request that incorrect personal data about you is corrected/rectified
- receive a copy of your personal data (data portability), and
- send a complaint to the Norwegian Data Protection Authority regarding the processing of your personal data

What gives us the right to process your personal data?

We will process your personal data based on your consent.

Based on an agreement with NSD Norsk senter for forskningsdata AS The Data Protection Services of Sikt – Norwegian Agency for Shared Services in Education and Research has assessed that the processing of personal data in this project meets requirements in data protection legislation.

Where can I find out more?

If you have questions about the project, or want to exercise your rights, contact:

- Høgskolen I Innlandet student sharafat Ali, e-post: sharafatshaikh3@gmail.com , or supervisor, Archlove Takunda Tanyanyiwa, e-post takunda.tanyanyiwa@inn.no.

Our Data Protection Officer: Usman Asghar , e-post: usman.asghar@inn.no ,or on Telephone number :55582117

If you have questions about how data protection has been assessed in this project by NSD , contact:

- email: (Persjonverntjenester@nsd.no) or by telephone: 55582117

Yours sincerely,

Project Leader

Student (if applicable)

(Researcher/supervisor)

Consent form:

I have received and understood information related to project “Exploring the role and experience of Norwegian GPs with to patients and state regulations.” And give permission to ask question, and therefore I consent,

- ☐ Voluntary participation in research interview
- ☐ My information anonymously can be used in publications.
- ☐ My information will be saved till end of project and anonymous will be saved till January 2025.

I give consent for my personal data to be processed until the end of the project.

(Signed by participant, date)

Appendix c:

Approval from NSD

12/05/2024, 13:47 Meldeskjema for behandling av personopplysninger

https://meldeskjema.sikt.no/657b4597-96ef-4f50-ab3b-c56fe3f0439d/eksport 1/3

Meldeskjema

Referansenummer

259708

Hvilke personopplysninger skal du behandle?

Navn

Fødselsdato

Stemme på lydopptak

Prosjektinformasjon

Tittel

Exploring the role and experiences of Norwegian General Practitioners with antibiotic prescriptions: A qualitative study

Sammendrag

My goal is to explore the experience of Norwegian general practitioners around antibiotic prescription that how they deal with the

patients that are demanding antibiotic prescription and how GPs adhere to state regulations of antibiotics prescription. This is a

qualitative study that will explore antibiotics resistance reasoning that are patients influence also one of reasons of antibiotic resistance.

Hva er formålet med behandlingen av personopplysninger?

This project will only use personal data for the purpose(s) specified here and will be processed personnel in accordance with data protection legislation (the GDPR). • All information that will be gathered before during and after interview will be stored safely and me

as a student and my supervisor Archlove Takunda Tanyanyiwa and my supervisor as all information are anonyms as well. • All

information like name, contact information that can identify you would be saved in system of Høgslone I innlandet by using the

services of “Services for sensitive data”.After interview it would not be possible to recognise the person from the information that has been given in interview.

Dersom personopplysningene skal behandles til flere formål, beskriv hvilke

The personal informations would just be regarding this project and not for other purposes.

Prosjektbeskrivelse

Project description.docx

Ekstern finansiering

Ikke utfyllt

Type prosjekt

Master

Kontaktinformasjon, student

sharafat Ali, sharafatshaikh3@gmail.com, tlf: +4792541180

Behandlingsansvar

Behandlingsansvarlig institusjon

Høgskolen i Innlandet / Fakultet for helse- og sosialvitenskap / Institutt for folkehelse og idrettsvitenskap

Prosjektansvarlig

Archlove Takunda Tanyanyiwa, takunda.tanyanyiwa@inn.no, tlf: +4792565958 Er

behandlingsansvaret delt med flere institusjoner?

Nei

Utvalg 1

Beskriv utvalget

My participants are doctors specifically general practitioners who have been working in Norway for at least 3 years.

Beskriv hvordan du finner frem til eller kontakter utvalget

12/05/2024, 13:47 Meldeskjema for behandling av personopplysninger

https://meldeskjema.sikt.no/657b4597-96ef-4f50-ab3b-c56fe3f0439d/eksport 2/3

i am contacting first of all health professionals to recruit participants and initiate the snowball method. So that the informed will

spread the information about the study .

Aldersgruppe

28 - 65

Hvilke personopplysninger vil bli behandlet om utvalg {{i}}? 1

Stemme på lydopptak

Hvordan innhentes opplysningene om utvalg 1?

Personlig intervju

Vedlegg

Interview guide.docx

Lovlig grunnlag for å behandle alminnelige personopplysninger

Samtykke (Personvernforordningen art. 6 nr. 1 bokstav a)

Informasjon til utvalg 1

Mottar utvalget informasjon om behandlingen av personopplysningene? Ja

Hvordan mottar utvalget informasjon om behandlingen?

Skriftlig (papir eller elektronisk)

Informasjonsskriv

Consent form.docx

Utvalg 2

Hvilke personopplysninger vil bli behandlet om utvalg {{i}}? 2

Utvalg 3

Hvilke personopplysninger vil bli behandlet om utvalg {{i}}? 3

Tredjepersoner

Innhenter prosjektet informasjon om tredjepersoner?

Nei

Dokumentasjon

Hvordan dokumenteres samtykkene?

Manuelt (papir)

Hvordan kan samtykket trekkes tilbake?

Consent can be taken back by contacting me and my supervisor and requesting to remove it.

Hvordan kan de registrerte få innsyn, rettet eller slettet personopplysninger om seg selv?

They can get it through information paper and i am orally explaining what is written on information paper.

Totalt antall registrerte i prosjektet

1-99

Tillatelser

Vil noen av de følgende godkjenninger eller tillatelser innhentes?

Ikke utfyllt

Sikkerhetstiltak

Vil personopplysningene lagres atskilt fra øvrige data?

Ja

Hvilke tekniske og fysiske tiltak sikrer personopplysningene? 12/05/2024, 13:47

Meldeskjema for behandling av personopplysninger

https://meldeskjema.sikt.no/657b4597-96ef-4f50-ab3b-c56fe3f0439d/eksport 3/3

Fortløpende anonymisering

Kryptert overføring

Kryptert lagring

Flerfaktorautentisering

Adgangsbegrensning

Endringslogg

Adgangslogg

Hvor blir personopplysningene behandlet?

?

Hvem har tilgang til personopplysningene?

Prosjektansvarlig

Student (studentprosjekt)

Databehandler

Hvilken databehandler har tilgang til personopplysningene?

Data Protection Officer: Usman Asghar , e-post: usman.asghar@inn.no ,or on Telephone number :55582117

Overføres personopplysninger til et tredjeland?

Nei

Avslutning

Prosjektperiode

27.01.2024 - 10.06.2024

Hva skjer med dataene ved prosjektslutt? Persondata

lagres midlertidig 31.01.2025

Hva er formålet med lagringen av persondata?

Dokumentasjonshensyn

Vil enkeltpersoner kunne gjenkjennes i publikasjon?

Nei

Tilleggsopplysninger

Since the discussion is primarily about doctors and their patients, the patients anonymity is the center of concern, no information

that can identify the patient will not be given. The discussion will only be about experiences of antibiotics prescription.