

**Nursing students' attitudes towards COVID-19
vaccination in Finland**

A semi - structured interview study

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Abstract

The study investigated nursing students' attitudes towards COVID-19 vaccination and identified factors influencing their attitudes, aiming to enhance knowledge on the subject to achieve a total vaccine acceptance among healthcare workers and the public at large.

This study was motivated by the Nola Pender Health Promotion Model theory. Data was collected through semi-structured interviews of 7 nursing students who were identified by purposive sampling and analysed by systematic content analysis to have themes and subthemes.

All the participants had a positive attitude towards COVID-19 vaccination and had been vaccinated with one or more doses. 57.4% (4) had no COVID-19 vaccination hesitation which was attributed to work requirements or clinical practice policy, trust in the health system, self and community protection, availability of reliable information, traveling requirement, frontline experience, underlying health condition, and to motivate others. 42.6% (3) had hesitation due to misinformation and limited information, quality of vaccine, short clinical trials, lack of trust in the health system, past vaccine failures, side effects, fear of the unknown and political concerns. The findings suggest that the fact that nursing students are future healthcare personnel who play a major role in health promotion, their curricula could be incorporated with more relevant information to address vaccination hesitancy.

Language: English

Key words: COVID-19, Vaccination, Attitudes, Nursing, Students, Hesitation

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1 Introduction

The spread of the coronavirus disease 2019 (COVID-19) has caused a major global humanitarian disaster, affecting all aspects of life on the planet with over 770 million confirmed cases and over 6.98 million confirmed deaths (October 19, 2023), according to the World Health Organization (WHO), (2023a). Countries all over the world have taken stringent precautions and COVID-19 outbreak control measures, such as social isolation and the mandatory use of face coverings, among others, including vaccination, with over 13 billion vaccine doses administered as of June 2023 (WHO, 2023b). COVID-19's devastating effects on health, life, and the economy continue globally. The world's hopes are tied to a successful preventive measure, vaccination, which has demonstrated its ability to stop infections and save lives over the years.

Some of the vaccines listed for use by the WHO are Pfizer-BioNTech, Moderna, Novavax, Johnson & Johnson's Janssen AstraZeneca/Oxford vaccine, Sinopharm, Sinovac, Covaxin, Covovax, and CanSino, among others. There are several vaccine candidates still in the clinical trial phase, as COVID-19 vaccine development and deployment have been the quickest of their kind, leading to mixed reactions, attitudes, and perceptions towards the acceptance of the vaccines (WHO, 2023c)

Despite the availability of vaccines that have received approval from a number of organizations, including the European Centre for Disease Prevention and Control (ECDC), Food and Drug Authority (FDA), Center for Disease Control (CDC), and WHO, there have been delays or refusals for vaccination by healthcare workers. However, one would assume that because they are on the front lines, they are aware of the disease's effects. Vaccination hesitancy was named one of the top ten global health challenges by the WHO, which has set supporting vaccine availability and combating hesitancy as targets for 2023. Nursing students and other healthcare workers (medical doctors, Nurses, students and trainees, laboratory personnel, therapists, pharmacists, social workers, administrators and all those that come in direct contact with the patient care system) all have qualities that would in reality make them accept vaccination without hesitancy, like being members of professional societies that support vaccination, having clinical experience, having advanced education in medicine, and being at the forefront of the pandemic. Other scholars argue that the refusal to take the vaccine by HCWs puts themselves and their patients at

high risk of disease (Klompas et al., 2021), and being leaders in the field could set a poor example for the general public.

This study aims to contribute insights into the attitudes of nursing students towards COVID-19 vaccination. Additionally, it seeks to identify and analyze the factors influencing their attitudes. The primary goal is to pinpoint key determinants that can be addressed strategically to enhance vaccine acceptance among this demographic.

2 Background

The literature review in this study was focused on understanding the COVID-19 pandemic, vaccination as a highly effective preventive method of infectious diseases, the picture of COVID-19 vaccination in Finland capturing the its coverage under the national vaccination program. COVID-19 vaccination attitude among HCWs was checked and the role of the HCWs in COVID-19 vaccination acceptance was reviewed in existing literature.

2.1 COVID-19 Pandemic

COVID-19 was declared a pandemic on March 11, 2020, by the WHO in response to the severity and rapid spread of the coronavirus disease caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARSCoV2) (WHO 2020). A few months later, the health systems of countries were overwhelmed with the number of patients with severe acute respiratory symptoms. To avoid human contact and stop the spread of COVID-19 among their populations, countries implemented severe containment measures like face masks, washing and sanitizing of hands, internal travel restrictions, and international border closures (Unruh et al. 2020). When the 73rd World Health Assembly convened, it adopted a resolution recognizing national vaccination programs as essential tools for halting the spread of COVID-19 (Hendel, 2022). Many vaccines were to be developed in a record amount of time, tested, and approved internationally to fulfill this worldwide priority.

2.2 Vaccination and immunization

The process of administering a vaccine to the body in order to create immunity to a particular disease is known as vaccination, where a person is protected against a disease through the process of immunization (CDC, 2021). Immunization is a crucial component of primary healthcare and an indisputable human right. It's also one of the best financial

investments you can make in your health. Vaccines can be used to stop and manage infectious disease outbreaks and will be an essential tool in the battle against antibiotic resistance and promote global health security according to Mohammad, (2022).

The use of vaccinations as a kind of preventative and protective healthcare is significant and highly effective, dating way back in history. Viruses, nucleic acids, fragments, weakened, or destroyed microorganisms are used to create vaccines, which activate the body's immune system to combat the infection. Due to the body's immunological memory, which prompts a response to the presence of a pathogen, a person who has received a vaccine for a certain disease develops a specific immunity against contact with the same disease in the future (Olson et al., 2020).

2.3 The National Vaccination Program in Finland

The Finnish Institute for Health and Welfare (THL), which also keeps an eye on the diseases that can be prevented, and the Ministry of Social Affairs and Health collaborate to make decisions about the vaccination program. Vaccination is coordinated according to the Communicable Diseases Act 1227/2016, where municipalities that cooperate with their hospital districts and private sector actors and everyone residing in Finland can get vaccines free of charge, although priority is given to healthcare and social workers, senior citizens, and based on the incidence of coronavirus infection (THL, 2022).

Changes in the prevalence of infectious diseases that vaccines can prevent, changes in the protection vaccines provide, changes in the effectiveness of that protection, changes in the severity of the disease, associated secondary diseases, and long-term negative effects or unfavorable consequences after immunizations in risk populations all have an impact on the vaccination campaign (THL, 2020).

Other vaccinations included in Finland's national vaccine program besides COVID-19 are vaccination for rotavirus; DTaP-IPV-Hib, sometimes known as the "5-in-1 vaccine," is a vaccine against diphtheria, tetanus, pertussis, polio, and Hib; DTaP-IPV, sometimes known as the "4-in-1 vaccine," is recommended for youngsters; DTaP vaccine, or diphtheria, tetanus, and pertussis vaccine, is recommended for adults and adolescents; Adults who need the DT vaccine (vaccine against diphtheria and tetanus), vaccinations against pneumococci, measles, mumps, and rubella vaccination (MMR), the MMR and varicella vaccine, sometimes known as the varicella vaccine, the human papillomavirus vaccination

(HPV), the "flu shot" influenza vaccine, and vaccination for polio BCG vaccine, HIV vaccine, vaccinations for hepatitis, and the "tick vaccine" or TBE vaccine (THL, 2020)

2.4 COVID-19 Vaccination

The COVID-19 vaccines have been proven to offer reliable defense against SARS-CoV-2 infection and the rapid spread of acute COVID-19. The use of vaccinations to immunize against COVID-19 has not only stopped the virus's transmission but also reduced the pandemic's severe health effects. Several vaccine candidates have been tested against COVID-19, shown to be safe and effective, and have been authorized. Most nations have done mass vaccination campaigns and population-specific immunization campaigns to be able to achieve high vaccination coverage (Sharif et al., 2021). At the national and international levels, the use of two messenger RNA (mRNA), three adenovirus vectors, four inactivated, and two protein subunit vaccines against COVID-19 has been authorized. Before being licensed for emergency or full use, these vaccine candidates underwent safety and efficacy testing in laboratories, randomized clinical trials, and observational studies (Pormohammad et al., 2021).

In comparison to other vaccines, COVID-19 vaccines have been created and used in a short amount of time. As a result, significant studies have been carried out to determine the effectiveness, safety, and side effects of the vaccinations against COVID-19. To figure out how well and safely the COVID-19 vaccines work for long-term protection, we need to look at the side effects of the vaccine in different social and demographic settings, the appearance of new SARS-CoV-2 variants that are different in their ability to infect and neutralize the immune system, and how long the antiviral antibodies that are made last. In a short period, new variations appeared and spread to various nations (Shinde et al., 2021). However, several studies have provided evidence of the effectiveness of the available vaccines.

2.5 The National COVID-19 vaccination program in Finland

The Ministry of Social Affairs and Health modified the coronavirus vaccination program in June 2022. The policy indicates that immunizations are intended to preserve the openness of society, protect the capacity of health care, and, specifically, lower the occurrence of severe coronavirus sickness. Finland chose the COVID-19 vaccines based on when they were expected to be finished and how well and safely they were thought to work. These

include the Comirnaty-branded mRNA vaccine BNT162b2, the Moderna-made mRNA vaccine Spikevax, the Johnson & Johnson adenovirus vector, the Novavax-produced protein adjuvant vaccine Nuvaxovid, and the Comirnaty variant 9 (THL, 2023a) from BioNTech and Pfizer.

2.6 COVID-19 vaccination coverage in Finland

The Ministry of Social Affairs and Health (MSAH) oversaw the creation of the national COVID-19 vaccination policy for Finland. The plan has been put into action in conjunction with the national hybrid strategy to stop the COVID-19 pandemic, and there are no specified numerical vaccine coverage goals in the programs. The COVID-19 vaccination has been required for health and social care professionals since February 2022. Companies are required to make sure that their employees don't endanger their clients, and as a result, they have the legal authority to process employee health information about prior COVID-19 infections and vaccination status. Although the public has opposed this stance, it is the employee's responsibility to get immunized or continue giving PCR-negative findings to work (Tiirinki et al., 2022).

THL updates its public webpage every day on vaccination developments in Finland. Based on information from the THL National Vaccination Registry, vaccination dosage data are reported. According to THL, (2023b) there has been good vaccination coverage for the first and second doses among all the targeted age groups, but vaccination coverage for the third and fourth doses has been more common with the elderly than young ones. Hardly have people who have received two vaccinations experienced a serious COVID-19 illness. About two out of every 100,000 fully immunized individuals experienced a serious COVID-19 infection that required hospitalization; these individuals were primarily elderly people. Those who have received vaccinations generally only experience minimal symptoms, with variant-tailored coronavirus vaccinations offering increased protection against severe coronavirus illness in those over 65 years old (THLb, 2023).

2.7 Vaccination hesitancy among Health care workers.

The delay in accepting, reluctance, or denial of vaccination despite the availability of vaccination services is known as vaccine hesitancy (Sallam, 2021). One of the top 10 challenges to world health, according to the WHO, is vaccination reluctance. Many studies conducted by numerous academics revealed the acceptance and reluctance of vaccination

among different populations and HCWs (Fares et al., 2021). Not only do some people hesitate to get vaccines, but vaccination rates might also differ among healthcare medical professionals. HCWs are very susceptible to SARS-CoV-2 infection and can spread the virus to patients and coworkers (Asad et al., 2020). Nonetheless, HCWs generally have a low vaccination uptake rate, with Europe having a lower than 30% influenza vaccination rate among healthcare workers (Dini et al., 2018).

Concerns about the fast pace of vaccine development, sensitivity to side effects, and the transmission of false information about the outbreak have been identified as the main causes of vaccine rejection and delay in the published studies on COVID-19. A complex relationship between mistrust of health and government authorities and new false information about vaccination safety and disease risk that emerges every day are other underlying causes of vaccine hesitation (Perron et al., 2022). Lower age, loss of income during the pandemic, lack of intention to get the flu shot, minimal confidence in the COVID-19 vaccine and the healthcare system (Lazarus et al., 2021), a worse perception of government measures, and a perception that the information provided is inconsistent and contradictory (Larson & Broniatowski, 2021) are some of the other influencing factors that have been identified by prior studies.

Some academics say that the lack of enough clinical trials and worries about the vaccine's side effects are the main reasons why HCWs don't want to get vaccinated. They also say that getting enough and correct information about the available vaccines is the most important thing that could get HCWs to accept vaccinations (Fares et al., 2021). Vaccination is a personal decision, but those who choose not to receive it have a significant impact on the pandemic's course, which might jeopardize current COVID-19 containment efforts and have detrimental effects on the entire healthcare system (Perrone et al., 2022).

2.8 Health care workers role in vaccination acceptance

According to THL in Finland, only a doctor, a registered nurse, a public health nurse, a midwife, or a paramedic licensed as a nurse are qualified to provide vaccines. Nearly all universities of applied sciences employ the national vaccine competency training package that equips healthcare workers with all the required knowledge and skills, and in turn, these support the national vaccination programs (THL, 2023c). The role of healthcare professionals in lowering vaccine hesitancy and resistance is crucial, as they engage in health promotion and prevention (Gallé et al., 2022).

With research-based actions, healthcare practitioners and other healthcare actors can preserve and improve public confidence in vaccine acceptance. They can gain from using motivational interviewing techniques, particularly when dealing with people who are reluctant to get shots. These techniques try to inspire enthusiasm for lifestyle or behavioral change through dialogue and listening rather than clear instructions or coercion. They have been trained on how to deal with skeptic patients and convey accurate vaccination information while being mindful of their attitudes and the tone in which they impart knowledge. One of the key roles of nurses is to promote health and encourage disease prevention. Nursing students are the nurses of the future, and finding out their COVID-19 vaccination attitude and factors that influence their attitude is key to tackling the gap and achieving good vaccination coverage (Sivelä et al. 2018).

2.9 Adverse effects of COVID-19 vaccines

The creation of accessible, practical, safe, and transportable vaccines was required to put an end to the pandemic crisis. The COVID-19 vaccine carries some dangers; however, no vaccine is 100% risk-free. The COVID-19 vaccinations' short-term side effects typically show mild symptoms. Localized pain and swelling at the injection site, headache, fever, myalgia, and chills are the most typical symptoms. Most thrombosis cases, particularly cerebral venous thrombosis, are associated with adenoviral vector vaccinations. The mRNA vaccines include side effects that can include myocarditis, renal disorders, and cutaneous eruptions. Although tracking over a longer period may give insight into any future adverse reactions and rule out reactions that are mistakenly attributed to vaccinations, the majority of vaccination reactions peak within the first 6 weeks of receiving the vaccine (Mushtaq, 2022). Fear of vaccination reactions was not associated with vaccination refusal in a study by Holzmann-Littig et al., (2022); however, fears of serious short- and long-term side effects were very clearly associated with vaccination rejection.

3 Aim of the study

The study aims to enhance understanding of nursing students' attitudes towards COVID-19 vaccination and to identify the factors influencing these attitudes. The research specifically focused on two objectives: first, to investigate the attitudes of nursing students towards

COVID-19 vaccination, and second, to establish the factors that contribute to shaping these attitudes.

3.1 Study questions

What are the attitudes of nursing students toward COVID-19 vaccination?

What factors influence their attitudes?

4 Theoretical framework

The Nola Pender Health Promotion Model Theory is the theoretical framework that is most relevant to this study. The individual's traits and experiences, as well as behavior-specific cognitions and effects, which encompass an individual's views, attitudes (where the focus is on nursing students' attitudes towards COVID-19 vaccination), and beliefs regarding health-related behaviors, are among the fundamental ideas of the health promotion model. It takes into account elements like personal values, perceived advantages, and obstacles, as well as self-efficacy. Health behaviors have a significant impact on behavioral consequences, dedication to a course of action involving a person's will and determination to adopt healthy habits and see their plans through to completion, short-term and long-term objectives, and environmental factors of physical (prevent themselves from COVID-19 even before taking the vaccine), social (safe to meet relatives, friends, and community), and cultural (norms within their own culture). The model places a strong emphasis on giving people (nursing students in this case) the tools they need to actively promote their own health and that of others. It acknowledges the intricate interactions that shape health-related behaviors between environmental influences, behavior-specific cognitions, and personal factors (Alligood, 2018).

This theory aims to help nurses understand the main factors that influence health behaviors so that they can provide behavioral counseling to encourage healthy lifestyles (Alligood , 2018). Individuals who are vaccine-hesitant can be better understood if the reasons for their attitude are known. Knowing the causes of vaccination hesitancy among nurses will help in incorporating specific aspects to address the causes and would assist in preparing particularly extensive patient education programs that address these concerns through health promotion.

5 Methodological frame work

To address the research questions, this study employed a qualitative research methodology where it gathered data in the form of descriptions or words and used interpretative analytic techniques to analyze it. The goal of qualitative research is to comprehend social phenomena in terms of the meanings that individuals assign to them. It investigates its nature rather than merely accepting the explanations that society has traditionally offered. Additionally, qualitative research methods facilitate understanding people's perspectives and opinions, which open up the possibility of conducting research on specific spheres of

social life that are not amenable to quantitative research methods like attitudes (Pope & Mays, 2020). The benefit of qualitative research is that it allows for the study of individuals in their natural environments and the application of multiple data collection techniques.

In this study, a pilot study of semi-structured questions was conducted on two participants to ensure that the interviews would generate proper responses. Purposive sampling of eight nursing students was carried out, and these participants gave consent to participate in the study. The seven nursing students were selected purposefully so as to have an easy match between the participants and the specific objectives and aim of the study (Campbell et al., 2020). The appointment for the interview was agreed upon between the interviewer and correspondents, and all interviews were physical. The semi-structured interviews were conducted carefully noting personal behavior and facial expressions to get more detailed information about the participants' attitudes (Monday, 2019). Every unsaid word was captured in the moment by noting the participants' body language and facial expressions.

5.1 Data collection

Interviews are one of the most popular ways to gather data for qualitative research projects. Regardless of the sectors, a number of significant studies have employed qualitative interviews as the basis for their investigation (Peters & Halcomb, 2015). Data was collected by interviewing eight nursing student in a one on one semi structured interview capturing demographic information, whether they received the COVID-19 vaccine, which type of vaccine and how many doses, reasons for their choice to receive the vaccine, how it was for them to make the decision and why and the challenges they faced to make the decision to take the vaccine. The seven nursing students were selected through purposive sampling so as to have an easy match of the participants to the specific objectives and aim of the study (Campbell et al., 2020). The participants were chosen among the social circles of the author through normal interactions in places like the café, lecture room, work environment and church. The researcher introduced the subject casually to the participant and asked if they were interested to participate in the study. With the interested participants the date, time and venue of the interview was set. The inclusion and exclusion criteria were as in Table 1. Interviews were audio recorded, lasted approximately 10-15 minutes and manually transcribed to Microsoft word document immediately after the interview to best capture the unsaid words that were observed from the facial expressions and body language.

Table 1: Inclusion-Exclusion criteria for interviews

Inclusion criteria	Exclusion criteria
Nursing students	Graduate nurses
Nursing student studying in Finland	Nursing student studying outside Finland
Nursing student who gave written consent for the study	Nursing student who did not give written consent for the study
Nursing student who did not withdraw the written consent for the study	Nursing student who withdrew the written consent for the study

5.2 Data analysis

Obtained data was transcribed, captured in Microsoft word and analyzed by systematic content analysis. Two popular methods for data analysis in nursing research are qualitative content analysis and thematic analysis. When examining written, spoken, or visual materials, content analysis is methodical and impartial, classifying the information into themes or categories to improve comprehension of the data (Vaismoradi et al., 2013).

The content of each interview was carefully analyzed word by word to pick out major themes and sub themes. The two themes of positive attitude with no hesitation and positive attitude with hesitation were color coded with green and blue respectively making sure that all the sub themes were highlighted with the respective colors. The thematic data was then captured and analyzed in excel.

5.3 Ethical considerations

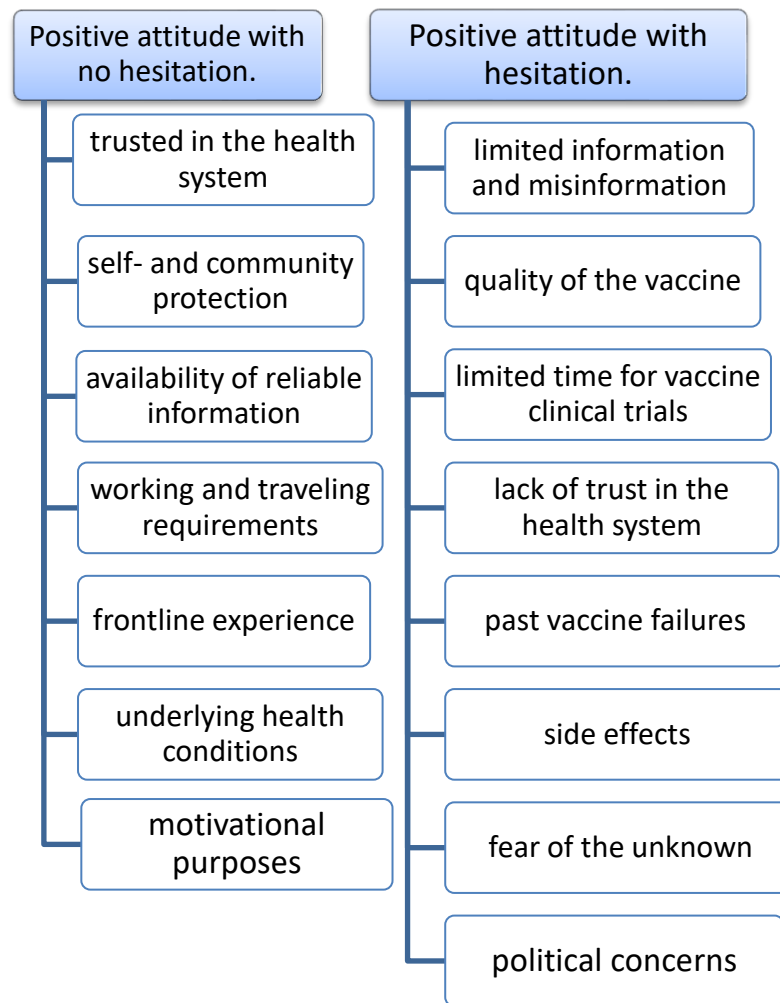
The interviews were audio recorded with consent and the confidentiality of all data generated from this study was assured. No individual identification including names, address, contact details, was captured. All data was transcribed and coded to maintain confidentiality. Access to interview content was restricted to only the researcher. Upon completion of this research all data collected will be destroyed.

The participation was voluntary and participant had the liberty to withdraw from the study at any time without prejudice. Participants were encouraged to freely ask for more information where they needed further clarifications. The majority of institutions often require ethical approval before conducting research-related interviews on their subjects following ethical guidelines (Edwards & Holland, 2013) but in this study participants were obtained outside their institutions following the Finnish National Board on Research Integrity TENK guidelines (TENK, 2023).

6 Results

Two themes and fifteen subthemes summarized in figure 1 below were identified in the study. The themes were a positive attitude with no hesitation and a positive attitude with hesitation towards COVID-19 vaccination. The sub-themes were trust in the health system, thoughts on self- and community protection, the availability of reliable information, their working and traveling requirements, frontline experience, underlying health conditions, motivational purposes, misinformation and limited information, the quality of the vaccine, limited time for vaccine clinical trials, lack of trust in the health system, past vaccine failures, side effects, fear of the unknown, and political concerns.

Figure 1: Themes and subthemes



6.1 Background information

A total of eight nursing students participated in the study, but results from seven of them are presented here due to the withdrawal of one participant after data had been analyzed. The interview data was transcribed on 17 pages of a Microsoft document and then summarized in an Excel sheet. Each interview lasted, on average, 11 minutes. Four of the participants were female, and three were male. 2 students were from Europe (Finland), 2 were from Asia (Pakistan and the Philippines), and 3 were from Africa (Kenya, Cameroon, and Nigeria). The age range was between 21 and 39 years, and the average age was about 32 years. Five students (71.4%) were employed, while two (28.6%) were unemployed. There was a 100% positive attitude towards the COVID-19 vaccination among nursing students however 57.4% had a positive attitude with no hesitation, while 42.6% had a positive attitude with hesitation.

6.2 Positive attitude without hesitation

The Nursing students who had a positive attitude without hesitation took the vaccine without any second thoughts and did so because they trusted in the health system, their thoughts on self- and community protection, the availability of reliable information, their working and traveling requirements, their frontline experience, their underlying health conditions, and for motivational purposes.

The participants from Europe expressed their trust in the health system and were confident that anything recommended by the health experts was safe and authentic. As one participant said, *“Of course I trust the health system, and because they encouraged everyone to take the COVID-19 vaccine.”*

“I took Fizzer in three doses, and this was because it was recommended by the health care system. So I took one in Aland, then the second from here in Finland, and after some time, the health system required nurses to take a booster dose, and I took the third one.”

Self-protection and protection of others in the community were common findings, as all the participants had some basic knowledge of how vaccines work. One of the participants said, *“To protect myself and my family is basically the main reason I took the vaccine.”*

Another participant said, *“I needed to prepare myself so that whoever comes to me for care, I shouldn’t be the source of harm but contribute to the process of cure.”*

Some participants believed they had access to sufficient reliable information, either from the government, the health system, or scientists. *“So it was so easy to make the decision to take the vaccine with all the information I had.”*

“I felt I had enough information, but now after studying about the vaccines, maybe I should have considered having more information, but it wouldn’t have changed anything.”

Having COVID-19 vaccination as a requirement to work or study was mentioned by all participants, as one said, *“There was mandatory vaccination for all health care workers.”*

There was one participant who said that they were on the frontlines in the fight against COVID-19 and had to take the vaccine with no hesitation: *“In my small town, I was leading the team of frontline responders at the district hospital, and the pressure was real and taking the vaccine was not debatable.”*

All the participants that were from outside Europe (Asia and Africa) mentioned that taking the vaccine was a requirement to travel out of their home countries as well as entry to Finland, *“There was no way one could travel out of my country, especially using the airport without the vaccination certificate”*, one participant said.

One participant mentioned having an underlying health problem, and for that matter, they had to take the vaccine so as not to compromise with their health. Another participant said, *“For me, it was kind of easy because my mom suffers from a medical condition, and from the beginning, I knew I had to take it so she doesn’t get hurt with COVID-19.”*

Finally, participants with a positive attitude and no major hesitation towards the COVID-19 vaccination indicated that, as nurses in the making, they had to take the vaccine so as to lead by example. One participant said,

“Because we are studying to be nurses, and nurses are advocates of life and health, so how can we advocate for the wellbeing of the people around us if we are not considering the things we learn from school? We must be ambassadors.”

6.2 Positive attitude with hesitation

The nursing students who had a positive attitude with hesitation had a pause before taking the vaccine and this was due to misinformation and limited information, the quality of the vaccine, limited time for vaccine clinical trials, their lack of trust in the health system, past vaccine failures, side effects, fear of the unknown, and political concerns.

All of the participants, who were from Africa and had a positive attitude with hesitation, mentioned misinformation. *“There was this misinformation going on, especially on social media, that if you took the vaccine, you would become infertile, and not getting children in the future was my main worry,”* one said.

Apart from misinformation, the participants felt there was not enough information on the ground, which led to growing levels of skepticism, as a certain participant said.

“If not for my profession and academic knowledge, I would have sided with the anti-vaccine side because there was too much skepticism about the vaccine. As a result, I had to look for a way to access the information that the vaccine's laboratory developers had

provided. With this knowledge, I was able to understand the situation in front of me, which was the vaccine's fear”

Participants from Africa were worried about the quality of the vaccine.

“With the belief that developing countries don’t get quality products or are rejected from developed countries, I needed to answer if the vaccine to be taken was not a diluted version just meant for Africans.”

Another participant was more concerned about the cold chain and the handling of the vaccine by the vaccinators.

“Vaccinations are taken not to be safe because if you see the kind of cool boxes they use for carrying the vaccines around, they don’t look neat and functional, and the people carrying them don’t handle them well.”

Other participants felt that there was never enough time for clinical trials, so the quality, safety, and efficiency of the vaccine were questionable. *“The vaccine was developed faster than any other vaccine in the world, with less data available to substantiate its effectiveness,”* one said.

Participants from developing countries had doubts about their respective national healthcare systems:

“Well, I think mostly in Africa, acceptance of any vaccine is on the low side. People don’t trust the healthcare system, and I don’t trust the system either; in fact, the major reason I hesitated is that I don’t trust the people giving the vaccine and the way they do it.”

One participant mentioned that in the past, some vaccination failures gave the public a negative attitude toward taking the COVID-19 vaccines.

“And there was a certain outbreak of a disease in my region, and it was targeting children, and at the end of the vaccination, there were no positive results; in fact, many children died.”

Participants mentioned side effects of the vaccine like headache, fever, thrombosis, and myocarditis, and some participants simply feared the unknown.

“At first I feared to take the vaccine because I know vaccines have side effects like headache and fever but this particular one no one was certain about its side effects but some people said there were some cases of thrombosis and myocarditis. But later I just took the risk”.

Political issues associated with pharmaceutical companies’ intentions and ownership also caused hesitation in some participants, as they mentioned that the public waited to see the politicians taking the vaccines so that they would trust them.

“The government officials like president, minister of health, Member of Parliament were telling people to taking the vaccination but we didn’t see them take the vaccine.”

7 Discussion

This chapter presents the argument for the choice of qualitative research method used, exploring its contribution to the credibility, dependability, conformability, and authenticity of the study results. It also presents the analysis of the results in comparison with other previous studies, highlighting agreements, disagreements, and limitations.

7.1 Discussion of method

This study analyzed nursing students' attitudes and the factors that influence them through an interview-based study with semi-structured questions that were standardized by performing a pilot study on two participants to ensure that the actual interviews generated appropriate responses. During the semi-structured interviews body language and facial expressions were noted to connect both the external and internal attitudes of the participants towards the subject (Monday, 2019). For credibility, the study had seven participants purposefully selected and interviewed with a semi-structured interview and body language interpretation to generate data that was carefully and repeatedly analyzed to achieve the aim of the study. The fact that the study's findings were consistent with those of earlier studies confirmed their dependability. For conformability and authenticity, this study has included direct quotations from the interviews (Elo et al., 2014). The study presented results from seven participants instead of eight, because one participant withdrew from the study, stating that they feared being judged for their opinion and following the ethical guidelines of research (TENK, 2023) their data was withdrawn from the study. The participant's data was withdrawn. This was accepted and was in line with the consent declaration that the participants agreed to at the beginning of their involvement in the study.

7.2 Discussion of results

Nurses' attitudes towards COVID-19 Vaccination play a vital role in the way the general public is going to respond to the vaccination program. Through the interactions between nurses and the general public, whether on medical grounds or random occasions, there is always a lot of health promotion information passed on from the nurse to individuals (Kregar et al., 2021). Knowing that nursing students are the future nurses and that their attitudes towards COVID-19 vaccination plays an important role in reducing vaccination hesitancy among the general population is in line with the Nola Pander Health Promotion

Model theory, which highlights the need for nurses to understand the main factors influencing health behaviors to provide behavioral counseling to support healthy lifestyles (Alligood, 2018).

This study found a 100% positive attitude towards COVID-19 vaccination among nursing students, and all the participants had taken one or more doses of the vaccine. This percentage is higher than that reported in earlier studies (Tharwat et al., 2022; Kim et al., 2023; Tieu Mai et al., 2023). The high positive attitude is almost similar to that reported in Poland (95.9) and Italy (94.7) (Szmyd et al., 2021; Pastorino et al., 2021). The high vaccination rate was attributed to the clinical practice policy, and this was in agreement with a study in South Korea (Kim et al., 2023). The study did not yield any significant association between the attitude towards COVID-19 vaccination and age, sex, marital status, year of study, or official language. This was similar to the findings from Koh et al. (2022). However, the study found that all participants from Africa had major concerns with the COVID-19 vaccination, and the reasons they gave for concerns about vaccination safety and adverse effects, mistrust of the health system and pharmaceutical industry, and contradicting or misleading information from the media were in line with what Ackah et al. (2022) documented.

The study found that 4 (57.1%) of the participants had a positive attitude with no hesitation towards the COVID-19 vaccination. This is lower than what a German study (Holzmann-Littig et al., 2021) reported. The participants attributed their vaccination acceptance mostly to working requirements and clinical practice policy. This was due to the clinical practice vaccination policy in Finland, and this was in agreement with a study by Kim et al. (2023). All of the unhesitating participants mentioned the need for travel, inspiring others, having access to reliable information, believing in the health system, having underlying medical conditions, and having first-hand experience responding to COVID-19 emergency care. These findings were similar to those of previous studies (Manning et al., 2021; Fares et al., 2021; Pastorino et al., 2021; Zimmerman et al., 2022; Kim et al., 2023).

A positive attitude with hesitation was found in three (42.9%) of the nursing students in the study. This finding is lower than that of a German study that found 53.3% hesitancy among nurses (Bauernfeind et al., 2021), but higher than the hesitancy reported in Uganda (Kanyike et al., 2021) and in Vietnam (Tieu Mai et al., 2023). The findings could be due to the highlighted concerns of limited information and misinformation, which were mentioned in a study measuring the impact of COVID-19 vaccine misinformation on

vaccination intent in the UK and USA, where social media was mentioned mostly as the source of most misinformation, and this was similar to what other studies reported earlier (Loomba et al., 2021; Zimmerman et al., 2022). Vaccine quality was highlighted in this study, with participants questioning its efficacy and cross-protection from new strains of the virus (Manning et al., 2021). The participants were of the view that the time frame for conducting clinical trials was limited, making the approval process compromised due to the shorter clinical trials carried out as compared to previous vaccine developments (Fakonti et al., 2021; Manning et al., 2021). The FDA's Center for Biologics Evaluation and Research (CBER), which published thorough recommendations on COVID-19 vaccine development in June 2020, made decisions about approvals and Emergency Use Authorizations (EUAs) of the vaccines on the market. The Vaccines and Related Biological Products Advisory Committee (VRBPAC), which is a collection of nongovernmental scientists including nurses, doctors, and other experts that reviews evidence for vaccine candidates including their benefits and risks and makes recommendations regarding approval, has supported CBER's decision-making for many decades (Manning et al., 2021). All of the participants from Africa mentioned a lack of trust in the healthcare system and pharmaceutical companies, which was in line with studies from Egypt and Uganda (Saied et al., 2021; Kanyike et al., 2021) that highlighted the factors affecting vaccination coverage. Side effects and adverse reactions were mentioned in this study, and together with the fact that the vaccine had been rushed to the market, participants felt there could be some consequences ahead, which was like in some studies that had earlier assessed the drivers of hesitancy towards the COVID-19 vaccination (Dodd et al., 2021; Fares, 2021). Fear of the unknown was discovered to be a present determinant of hesitation, just like in the study by Asmundson et al. 2020. Politicizing the COVID-19 vaccination program came up among vaccine-hesitant participants, and this was in agreement with Zimmerman et al. (2022). Strong hesitation was due to past vaccination failures for some participants, although not so many studies have assessed this factor in the past. Nurwarda et al. (2022) highlighted some of the historical vaccine failures, including politics, and their impact on public vaccination rates. These factors influencing COVID-19 vaccination hesitancy among nursing students were similar to those in previous studies (Dodd et al., 2021; Gadoth et al., 2021; Fares et al., 2021; Shekhar et al., 2021; Kim et al., 2023), making them targets to be addressed and a focus for future research.

7.3 Limitation of the study

The study had some limitations that future researchers could look into. Participant withdrawal due to fear of judgment about their opinions and attitudes was one of the major challenges to this study, as it reduced the number of themes and subthemes to be presented and discussed. More so, this study had a small sample size, and the results generated may not apply to other places as the participants are a very small proportion of the demographics, but the findings are illustrative. The biased sampling method makes it hard to generalize the findings. Additionally, there was no external expert review of the semi-structured questions, which might have compromised the questions' quality. The study would have generated better results if a semi-structured interview had been combined with another qualitative research method, like a literature review.

8 Conclusions

The study highlights the factors affecting the attitudes of nursing students towards the COVID-19 vaccination in Finland. It's important to know the reasons behind the COVID-19 vaccination attitudes so that they can be addressed throughout their training by incorporating more relevant information on the highlighted factors of misinformation, limited information, quality of vaccine, limited time for vaccine clinical trials (vaccine development and approval), lack of trust in the health system, past vaccine failures, side effects, fear of the unknown, and political concerns in their education curricula. It's also important to continue to shed more light on trust in the health system, self and community protection, availability of reliable information, working or clinical practice requirements, traveling requirements, frontline experience, underlying health conditions, and motivating others so that future health care professionals and ambassadors of health promotion, like nursing students, are well equipped and informed to promote vaccination acceptance, especially when new contagious diseases with a high spreading capacity are at hand, like COVID-19.

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Appendix 1: Semi structured interview questions

1. Tell me about yourself.
(Age, gender, education, marital status, language of use, Year of study, employment status,)
2. Did you take the covid19 vaccine? If yes how many doses of which vaccine and why?
3. How was it to decide on taking the vaccine? And why?
4. What challenges did you face to make the decision to take the vaccine?
5. Would you like to add something more?

Appendix 2: Informed consent for participants

I am a second year student in nursing degree program at Novia University of applied sciences. Am conducting this research for learning purposes

The aim: To explore knowledge on the attitudes of nursing students towards covid19 vaccination and understand the factors that influence their attitudes

Research Question:

1. What are the attitudes of nursing students towards COVID-19 vaccination?
2. What factors influence their attitudes?

The interview will be recorded; the confidentiality of all data generated for this research work is assured. No individual identification including names, address, contact details, email address will be asked. The interview will take approximately 10-15 minutes. All data will be transcribed and coded to maintain confidentiality. Access to interview content shall only be granted to researcher. Upon completion of this research all data collected will be destroyed.

Your participation is voluntary; you can withdraw at any time without prejudice. Feel free to ask and let us know if you need further clarifications

If you have any questions about this research work, kindly contact me my supervisor whose details are provided herein.

Participant's Signature Date.....

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