



COVID-19 among the Pakistani immigrant population in Northern Europe—Incidence and possible causes for infection

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ABSTRACT

Background: Data from several North European countries have indicated that the Pakistani immigrant populations have higher mortality, higher hospitalization rates and higher infection rates from COVID-19 than the majority populations. Therefore the aim of the study was to examine challenges faced by the Pakistani migrant community in Oslo during the pandemic.

Methods: We included data from national reports, national statistics and scientific articles and discussed them with data gained by 16 semi-structured interviews, and thereby elaborated challenges inhabitants of Norway with a Pakistani background experienced during the first year of the COVID-19 pandemic.

Results: The literature study confirmed that mortality, hospitalization, and infection rates from COVID-19 for the sub-groups of the populations with Pakistani background were consistently higher in Denmark, England and Norway, all countries that published data by ethnicity or origin, even when correcting for all known risk factors. Our interview data from Norway showed that information from the authorities was insufficient and not adapted to the needs of the minority population, especially in the early phases of the pandemic. Furthermore, information was not available in the common minority languages of the country. Another finding indicates that health literacy, particularly regarding COVID-19, seemed to be low in the Pakistani minority, and COVID-19 was not considered as a threat in Norway before death rates began rising in Pakistan.

Conclusion: Adapting information at an early stage to the countries' minority groups may help reduce the increase in COVID-19 rates.

1. Introduction

When the corona virus began to spread in the spring of 2020, Norway introduced radical national measures on very short notice. By March 13th, most of the country had been shut down and people were urged to work from home and to avoid public transport. Since then, the incidence of COVID-19 remained low in Norway, with very low mortality rates.

However, the impact of COVID-19 on migrants and ethnic minorities showed significant differences. Migrants and refugees are at higher risk of developing ill health than host populations (World Health Organization, 2018), and various studies show that low-skilled labour migrants in crowded living conditions have been disproportionately affected by the pandemic (Aldridge et al., 2020; Harrison et al., 2020).

Reports from Norway also show that migrants and ethnic minorities

have been more strongly affected by COVID-19 than the average population (Indseth et al., 2021c). A year into the pandemic, the Norwegian Institute of Public Health (NIPH) released infection rates for different population groups, including according to birthplace. The data show that socio-economic conditions might not be the only cause for the high infection rate of COVID-19 in the migrant population in Norway (Indseth et al., 2021b). The report further states that neither overcrowding, service occupations, health status, education nor income level explain the high level of infection among immigrants. When the NIPH corrected for these factors in its report, in addition to age, gender and municipality of residence, they found that high infection rates and hospital admission rates had to be caused by other factors (Indseth et al., 2021b). Health disparities are differences in health and health care that mirror differences in socioeconomic status, ethnicity, migration status,

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and education level (Riley, 2012). This also implicates that there are differences between, but also within ethnic groups. This article aims to highlight the disparities experienced by Pakistanis and their descendants, a group that demonstrated a disproportionately high incidence of COVID-19 during the first year of the pandemic.

Research concerning COVID-19 among immigrants is still limited. *We therefore aim to examine the challenges faced by the Pakistani migrant community during the COVID-19 pandemic and investigate the incidence of COVID-19 within this community by combining published register data and data from interviews with key informants from the Pakistani community living in Norway and by that find the possible causes of the high incidence and gain understanding of the lived experiences of this population.*

2. Materials and methods

The study design is based on a mixed method approach including both published register data, statistical reports, data gained by a literature search and notes from semi-structured interviews with 16 informants, carried out in the spring of 2021.

2.1. Qualitative data

The qualitative data included in the study emerged from a questionnaire survey which was developed in collaboration with a leader from one of the Pakistani-Norwegian associations, based in the east of Norway. The data included in the study are based on a total of 16 semi-structured interviews with informants who were either themselves immigrants from Pakistan to Norway, or descendants of such immigrants. Their data create a snapshot of the conditions for the Pakistani minority in the Oslo area in the first 12 months of the global COVID-19 pandemic. Aiming for purposeful richness in the data, we included both informants born in Pakistan and children of Pakistani immigrants.

One of the informants was a leader of a municipally supported Pakistani migrant organization in Oslo, the capital of Norway. This key informant had developed in his role an understanding of the purpose and focus of the inquiry, issues, and questions (Patton, 2002) (p 321). He was conscious of his role as someone who knew both majority and minority cultures well enough to translate between them, and was elected as leader because he knew both cultures (Småland Goth and Berg, 2011). In addition, we interviewed 15 informants aged 18 to 72 selected by “snowballing”, a purposeful sampling strategy, used to locate information rich informants (Patton, 2002) (p 237) and to include informants both within and outside the formal organisations, including two university lecturers.

We aimed at gender balance, asking equivalent numbers of men and women, but only three of a total of 16 informants who agreed to participate in the project were women.

After the first six interviews we experienced that we were approaching data saturation (Fusch and Ness, 2015). Nevertheless, Pakistani people in Norway are a diverse population, so to allow many different voices to be heard, we continued interviewing an additional ten informants. Data from 16 informants were included in the analyses.

By either having immigrated themselves or being a child of immigrant parents, all informants have experienced the structures and systems in Norway. Knowing both majority and minority behaviour patterns (the Norwegian and the Pakistani) some informants found themselves in the role as cultural translators (Patton, 2002) (p 238).

Our informants were perceived as sources of information and assumed to have an ability to explain/translate that we as outsiders could not experience ourselves (p.321). The informants chosen were knowledgeable about the topic and able to articulate in Norwegian (or, in one case, in English) about their experience. Since most informants in the study served as cultural mediators or interpreters (Småland Goth and Berg, 2011), it was critical that the majority were well-integrated into Norwegian society, fluent in Norwegian, and familiar with the systems and values also of the majority population (Bonder et al., 2002) (pp 118,

138), (Riley, 2012) (pp 321-322). Thus, many of the informants were children of immigrants, who knew both cultures and ways of thinking. It is noteworthy that the 16 informants were not a homogenous group with respect to age, language abilities, educational background, or length of residence.

2.1.1. Data collection

Before preparing the semi-structured questionnaire, we analysed recent research in the field. The questionnaire was piloted before the interviews by two individuals with Pakistani background. The interview guide for the semi-structured interviews listed questions that elucidate and illuminate the key informants' experiences and opinions about COVID-19. The exact wording and sequence of open-ended questions were determined in advance. “The guide helped to make interviewing more systematic and comprehensive by delimiting in advance the issues to be explored” (Patton, 2002) (p 343). We conducted the interviews at sites and times most convenient for the informants, including by phone. Each interview lasted 30 to 60 min, and was rounded up by a closing question providing an opportunity for the interviewee to have a final comment (Kvale, 1996) (p 87). Thus, we gained insights from knowledge generated from the interviews. Fear of limiting the richness of sensitive data, difficulties in getting approval from the ethics committee and the risk of conceptually repetitive data (p 109) led to the conclusion that we would abstain from using an audio recording device, which was also in line with the wishes of most of the informants. During the entire interview, the interviewer remained neutral regarding the content of what was said, writing it down promptly; statements were rendered exactly and written on the questionnaire (field notes). Illustrative quotations were placed within quotation marks. After the first verbatim note taking, a member check (verification by the interviewed) was performed to control for potential bias and to assess the consistency of the information obtained from informants (Patton, 2002) (p 381). In a post-interview reflection, immediately after each interview to avoid recall bias, additional contexts or thoughts were marked in brackets. Quotations were translated by the first authors from Norwegian to English.

2.1.2. Analysis

The analysis was seen as “a process of examining and interpreting data in order to elicit meaning, gain understanding, and develop empirical knowledge” (Kvale, 1996) (p 1). Empirical data were collected in an inductive way (empirical grounding) and thereafter coded and grouped. Pre-existing theories found within the previous analysis were compared with data from the following interview (theoretical grounding). Internal grounding (by topic with the emerging theory) was achieved by congruence within elements of the theory found in the literature search, aiming to find possible causes, challenges, or obstacles for the target group. The applied approach aimed to capture and to describe central issues and themes, and heterogeneity sampling – the sampling of maximum variation – was applied (Patton, 2002) (pp 234-235). A content analysis was carried out by breaking the text into meaningful units, and objective systematic coding was performed to produce quantitative descriptions of the material. By deriving coding strategies, each unit of interview data was analysed by the exchange of logical arguments (dialectic) and by continuously being in a dialogue with relevant literature (dialogistic). Focussed on finding conceptual categories in the data, we thereafter looked at the relationship between the categories and core information. After translating the direct quotes from the informants, an additional analysis was performed by and discussed with the other authors, who were not present during the interviews.

2.2. Ethical clearance

The interviews were conducted according to the interview guide, after respondents received information about the project and gave their

informed consent. The study design, information and consent form had previously been approved by the Norwegian Data Inspectorate (NSD; reference 286001 – 2021).

2.3. Methods used to glean data from literature

A literature search was conducted for relevant reports, statistics, and peer-reviewed literature about COVID-19 infection in minority populations from Pakistan with focus on hospitalization and death rates. Further search for additional literature was performed using the snowball method, following the references in the literature found in the primary search as well as references from municipal reports and other forms of grey literature.

The accessible data from the relevant literature on COVID-19 within Pakistani minority populations is included in Appendix A, irrespective of whether the data took the form of odds ratios, hazard ratios, mortality rates or crude data. In several articles, data for Pakistani and Bangladeshi immigrants were combined, and since one of the arguments the present article makes concerns a potential genetic susceptibility, this was deemed to be acceptable, these two populations having quite similar genetic backgrounds (Ayub and Tyler-Smith, 2009). We also noted whether the data were adjusted, and for which factors, or unadjusted. In this manner, we attempted to make data from different populations somewhat comparable, though we had no access to the original data.

3. Results

3.1. Data based on published national reports and statistics in Denmark, England, and Norway

National reports and statistics elaborated how mortality, hospitalization rates and infection rates differed between the Pakistani minorities and the majority populations during the first 12 months of the outbreak of COVID-19 in Europe.

As Table 1 (and Appendix A) shows, both mortality (Harrison et al., 2020; Larsen et al., 2021; Platt and Warwick, 2020; White and Nafilyan, 2020), hospitalization rates (Indseth et al., 2021a; Lassale et al., 2020) and infection rates (Indseth et al., 2021a; Niedzwiedz et al., 2020; Statens Serum Institut, 2020) were higher among people of Pakistani ethnic origin than among the European majority populations in the first phase of the pandemic. The published studies all used register data to show this.

It is worth noting that few of the data are fully comparable, since the authors used different age groups, both Relative Risk, Hazard Ratio and Odds Ratio, which are different measures of probability, and used many different kinds of standardization. In the statistics from England and Wales, people of Pakistani origin are sometimes grouped with other population groups. In Norway, only first-generation immigrants (born in Pakistan) can be distinguished, whereas other countries look at ethnic origin, irrespective of the number of generations a person's family has lived in the country. Nevertheless, there are clear patterns in infection rates, hospitalizations, and deaths.

In Norway, as early as in October, 2020, researchers had noticed that the infection rate, measured in positive tests, among Pakistani-born immigrants in Norway was seven times the infection rates among non-immigrants (Indseth et al., 2021c). It was therefore considered vital to

monitor developments in all major immigrant groups as well as to develop appropriate information materials directed towards the different groups to lower the threshold for testing (Indseth et al., 2021c). At the time of analysing data and writing this article, Indseth et al. had published four reports and one peer-reviewed article about ethnic differences in COVID-19 illness in Norway (Indseth et al., 2021a, 2021b, 2021c, 2021d; Indseth et al., 2020), including regional data from the two largest cities in Norway. Data from June 15th, 2020, when the test capacity had become acceptable, to March 31st, 2021, had been published. These data show that among Pakistani-born immigrants in Norway, 9173/100 000 have had a positive Corona-test, compared to 1175/100 000 in the majority population. 898/100 000 of the Pakistani-born immigrants in Norway have been hospitalized, compared to only 37/100 000 among those who were born in Norway (Indseth et al., 2021a).

Kjøllestad et al. analysed work backgrounds and found that immigrants from Somalia, Pakistan, Iraq, Afghanistan and Turkey, whose work implied many close personal contacts, had higher infection risks than Norwegian-born people doing the same work, but no higher risks than others from the same ethnic backgrounds (Kjøllestad and Magnusson, 2021).

Oslo, the capital of Norway, houses the highest proportion of migrants in Norway, and had the highest incidence of COVID-19 in the year following the outbreak. COVID-19 test rates differed from 5306/100 000 of the Pakistani-born to only 1345/100 000 among the rest of the population. 682/100 000 of the Pakistani-born had been hospitalized, compared to 62/100 000 in the majority population (Indseth et al., 2020). There are considerably fewer Pakistani-born in the age group most at risk for hospitalization (80+) than among the majority population, because the migration to Norway for Pakistani started in the late seventies, which makes the differing hospitalization rates particularly striking.

The Danish report from SSI, which updates and replaces an earlier report published in May 2020, includes very detailed descriptive data on the regional distribution of cases, as well as data on the distribution of cases within professions. The report refers to social reasons for the difference in infection rates, such as cramped housing, but offers no further analysis, which is planned for a later publication (Statens Serum Institut, 2020).

Larsen et al. (2021), who have also published extensive data materials pertaining to their article, used data stretching from January 2020, when the first registered case of COVID-19 disease took place in England, to the end of March 2021. They discuss the so-called first and second waves of the epidemic in England, before and after November 11, 2020, showing that the Pakistani population had higher hazard ratios (HR) for dying of COVID-19 than the majority population, with higher HR in the second wave, both for men and women. Using a fully adjusted model, Pakistani women did not have significantly higher risk of death from COVID-19 in the first wave, while a fully adjusted model from the second wave showed increased HR for both genders, but higher for men (Larsen et al., 2021).

3.2. Data from the interview survey

3.2.1. Information on COVID-19

In Norway, the occupational groups with highest incidence of

Table 1

The incidence of COVID-19 in Pakistani immigrants living in Norway, Denmark, and England.

	Pakistani mortality	Majority mortality	Pakistani hospitalizations	Majority hospitalizations	Pakistani infections	Majority infections
Denmark	na	na	na	na	2477/100K	248/100K
England	3.29 (RR)	0.88 (RR)	2.12 (RR)	1 (RR)	3.34 (RR)	1 (RR)
Norway	na	na	898/100K	37/100K	7866/100K	1107/100K

na = not available from published data at the time of writing.

100K = 100 000 inhabitants.

RR= Relative Risk.

COVID-19 infections during the first wave of the pandemic were health care workers and drivers of buses, trams and taxis (Vist et al., 2021) (p. 9). Many workers from those groups originate from Pakistan and immigrants from Pakistan often have limited comprehension in Norwegian. However, at the beginning of the pandemic, information from public channels were only distributed in Norwegian (Kunnskapsdepartementet (Norwegian Ministry of Education and Research) 2021). Information in Urdu was only provided one month after the outbreak began. Only then religious and Norwegian-Pakistani associations started to inform their members.

“Many (immigrant organizations) developed information paid by IMDI (government immigration agency). Quality was varying. The question is how one could quality check the information...” Informant 6, man, 40-49 years old, immigrated from Pakistan over 20 years ago.

Religious communities and mosques, which normally would distribute information, were closed. Public offices and local immigrant organizations distributed translated information on the most recent restrictions and other relevant information, but not all information was quality controlled.

The elderly in particular were challenged during this period and many elderly needed to rely on the information given by their family members.

“The elderly are not part of the digital world, and it was therefore challenging to get in contact with them”

Informant 11, woman, 40-49 years old, born in Norway.

“The children informed the elderly who don't speak Norwegian (the national language) ...it was difficult to get information from the mosque, because it was closed periodically ... it is therefore important that information is given in the mother tongue (Urdu)”

Informant 5, man, 20-29 years old, born in Norway to immigrants from Pakistan.

Months after the pandemic started several Facebook groups shared information online.

“It (information) was shared via social media. We ought to take the pandemic seriously. It took time to receive the correct information because the information was, in the beginning, only in Norwegian” Informant 12, woman, 40-49 years old, emigrated from Pakistan over 20 years ago.

Many migrants from Pakistan are dependent on information from their or their parents' original home country, and through travel and marriages keep closely in contact with their families in their country of origin. These contacts include financial support (International Organization for Migration, 2021).

Early on, Muslim religious leaders and organizations in India and Pakistan showed little interest in taking a stand on the pandemic (Riexinger, 2021). On the other hand, informants with a high level of integration into the Norwegian society felt informed and content with the information available to the public. In the beginning, when they did not receive understandable information, many immigrants did not follow the governmental restrictions and guidelines.

“The situation was especially difficult for large families in apartment blocks, especially for those in municipally financed apartments.”

Informant 3, man, over 60 years old, emigrated from Pakistan over 20 years ago.

“In the beginning the kids were at home because school and kindergarten were closed. Therefore, we had to be more at home (could not go to work)” Informant 14, man, 40-49 years old, emigrated from Pakistan over 20 years ago.

Closed schools and quarantine regulations challenged parents living with several children in small, municipally financed apartments.

“Minorities were totally isolated and did not receive the information they asked for.” Informant 3, man, over 60 - 69 years old, emigrated from Pakistan over 20 years ago.

Our interview data show that many immigrants, particularly the elderly, who are less integrated, were confused and did not fully comprehend the received information, which was given in the country's majority language. Translations by different translators resulted in

different meanings. Together with continuously changing official advice, this added to the confusion, especially at the beginning of the pandemic. As time went by, the information flow was received by migrant associations and distributed via various social channels to the immigrant populations, rules and regulations were followed and the immigrant population was just as careful as the rest of the population.

3.2.2. Quarantine and health literacy

“The members I have been in contact with follow the quarantine regulations.” Key informant 1, 50 – 59 years old, head of a Pakistani/Norwegian organisation in the Oslo area, emigrated from Pakistan over 20 years ago.

Ever changing regulations on a national and regional basis added to confusion. Several of our informants agreed that quarantine regulations were followed when the informants understood them. Most informants also pointed out that children and youth had the largest problem with understanding and following the official regulations.

“...many used their T-shirts as masks. I think the reason for that is low income and a low comprehension level of Norwegian (the official language) ...the ones (immigrants) who did not understand the news did not understand or trust the advice either...” Informant 2, man, 20-29 years old, born in Norway to immigrants from Pakistan.

The official advice, distributed by public channels, was experienced as confusing. In the end, this led to frustration, which reduced the willingness to use a face mask.

“...mostly the men do not use a mouth covering (mask). They are fed-up and say it is difficult to breathe, it steams the eyeglasses up, difficult to use” Informant 2, man, 20-29 years old, born in Norway to immigrants from Pakistan.

“...in my acquaintance circle I see that not everybody is careful with it (use of mask) and there is a preponderance of men who don't use masks.” Informant 6, man, born in Norway, 20-29 years old, son of immigrants from Pakistan.

“We have a large family, and everybody is on WhatsApp. We inform each other about the current regulations and restrictions” Informant 16, man, 30-39 years old, emigrated from Pakistan over 20 years ago.

Some informants pointed out that despite knowing that they ought to wear a mask, this was not always followed by the male population because of norms and traditions.

“Before the Delta-outbreak many believed in conspiracy theories, that there was no virus and that it was made by humans ... many use social media (for information) ... many did not understand how dangerous the virus was. And many did not take the virus seriously. But now after the Delta outbreak (in Pakistan) many people they know are dead. That gets so close. Many close friends have been sick.”

Informant 4, man, 40-49 years old, emigrated from Pakistan over 20 years ago.

“We used it (mask) the entire time. Bought many packages of masks. If I went to the shopping mall, we received a mask in case I forgot” Informant 13, woman, 40-49 years old, born in Norway.

Our qualitative data show that many of our informants, especially the elderly, follow the news almost exclusively in the country of their origin, and therefore many immigrants did not comprehend the danger of COVID-19 until the disease took a substantial number of lives in Pakistan. State authorities in Pakistan responded to the pandemic with lockdowns, but were not empowered to close mosques, and only Shiite mosques in Pakistan were closed. (Riexinger, 2021)

Data also indicate that using a face mask for men could be seen as inappropriate. This avoidance of face masks among men might be connected with the way only women in certain parts of Pakistan cover their faces.

Our data furthermore indicate that in Norway, younger informants tried to explain about risks and precautions to their elderly family members but expressed some frustration at not being understood.

Only when death rates in Pakistan started rising, many immigrants in Norway could relate to the danger.

3.2.3. Celebrations and contact with closer family

«I know many who travelled to Pakistan...I don't know why many did so...maybe pressure or deprivation. Many have become lonely and have been lonely for a longer period...» Informant 2, man, 20-29 years old, born in Norway to immigrants from Pakistan.

“...for us it is important to kiss, hug, touch each other – in our culture this creates bonds (connections).” Informant 3, man, over 60 years old, emigrated from Pakistan over 20 years ago.

“Three of my closer family members travelled to Pakistan to visit family.” Informant 4, man, 40-49 years old, born in Norway to immigrants from Pakistan.

“During the time no one could meet each other, the imam shared information on social media. And he pointed out that staying at home is equal to celebrating together (Eid).” Informant 12, woman, 40-49 years old, emigrated from Pakistan over 20 years ago.

As our data show, most immigrants from Pakistan have transnational connections because of marriage and friendship. In addition, social contact is an important part of social relations, with deep roots in the Pakistani culture. This explains why immigrants from Pakistan are more prone to travel to visit relatives and friends, and by that participate to import Covid-19 to Norway.

4. Discussion

COVID-19 infections vary in their course, from very mild to fatal. As our data show, the varying incidence might have different explanations. However, the disease tends to have a more serious course among Pakistani and their descendants in Norway.

When raising this statement, we believe that openness about the situation is important, not only to spare those who are primarily affected, but also, because it is necessary to be able to adapt advice and rules so that they hit where the infection is greatest, and where illness and death hit hardest.

4.1. Infection, hospitalization, and mortality

In Norway, Statistics Norway and the Norwegian Institute of Public Health analysed the national register data gained during the period up to the end of February 2021. When adjusting for gender, age, and municipality/city district, Indseth et al. still found a considerable overrepresentation of cases among Pakistani immigrants living in Norway compared to the rest of the population. There were 6759/100 000 positive tests among the Pakistani-born, compared to 1175/100 000 for inhabitants born in Norway, and 898/100 000 hospitalizations, compared to 37/100 000 for the Norwegian-born (Indseth et al., 2021a). In their analysis, Indseth et al. adjusted for profession, cramped housing, medical risk groups, education, and income. The results after adjustment show that these factors were not sufficient to explain the difference in COVID-19 rates between the Pakistani-born and Norwegian-born populations in Norway (Indseth et al., 2021a).

Crowded housing has been shown to be a contributing factor to infection rates, and people who live in crowded conditions have higher infection rates than people with the same ethnic background who do not live in crowded conditions (Habib et al., 2009, Mora et al., 2021). When Indseth et al. adjusted for crowded conditions, however, immigrants from Pakistan were still overrepresented (Indseth et al., 2021a).

When Indseth et al. adjusted for age, sex, and municipality, this explained only 21% of the over-representation in positive tests and 6% of the hospitalization rates among foreign-born in Norway. Adjusting for work, crowded housing, educational background, household income and belonging to medical risk groups in addition, reduces the rates further, but still cannot explain the whole difference in infection and hospitalization rates in Norway (Indseth et al., 2021a).

In Denmark, Larsen et al. found that measurable differences in domicile, social inequalities, work and health can explain only a part of the increased COVID-19 mortality in some ethnic groups (Larsen et al.,

2021). Similar findings were made in a Norwegian report elaborating the effects of ongoing interventions and assessing specific integration challenges connected with the pandemic in Norway (Kunnskapsdepartementet (Norwegian Ministry of Education and Research) 2021).

In England, after adjusting for a long list of factors, Lassale et al. concluded that all the measured factors, from lifestyle factors like smoking and alcohol, comorbidities like high BMI and diabetes 2 (T2DM), and socioeconomic factors from education to neighbourhood deprivation, are still not sufficient to account for the higher mortality in some ethnic groups (Lassale et al., 2020).

4.2. Living conditions

People in minority communities are more likely to live in smaller homes, particularly in flats rather than houses, and more often with their extended families. The authorities' advice to limit social interaction may therefore have exacerbated the infection in some immigrant communities, because adult children moved in with elderly family members.

As our informants mentioned, adult children in the Pakistani community often live with parents or siblings. Therefore, dividing families by the national system of “cohorts” represents a challenge. In addition, the interviews illuminated that the social pressure to gather in the Pakistani community is quite different from the pressure in the Norwegian culture. The social pressure to visit relatives is not only limited to Norway, but also is a possible explanation for the high frequency of travel to countries with high infection pressure. Celebrations like Ramadan and weddings are important family events, with required attendance by all family members (p 179-188).

4.3. Migrant health and health literacy

Research shows that immigrants, as well as people who have not emigrated, from Southeast Asia more often suffer from chronic diseases such as T2DM in early adulthood (Ramachandran et al., 2010; Aamir et al., 2020; Cainzos-Achirica et al., 2019). Literature shows that T2DM is a grave risk factor for serious COVID-19 disease (Wargny et al., 2021).

In Norway, workers with a minority background are overrepresented in sectors severely affected by the pandemic, such as transport, hotels, restaurants, and retail (Vist et al., 2021; Raisi-Estabragh et al., 2020). Furthermore, any economic crisis usually leads to companies dismissing employees with the lowest level of training or education, and in Norway, the last ones to be employed (OECD, 2012). On average, East Asian migrants in Norway are more often without recognized formal education, which makes them more vulnerable to losing their jobs or incomes due to COVID-19. Minority populations from Africa and Asia are more likely to be employed in sectors with a high risk of virus contraction, e.g. health, transport and service industry (Sodemann and Dyhr, 2020). As all people with unstable economy and low income, minorities are more likely to live in smaller homes, particularly in flats rather than houses, and more often with their extended families (Vrålstad and Wiggen, 2017).

4.4. Access to information and national COVID-19 regulations

In Denmark, Sodemann and Dyhr found that changing regulations have caused confusion and stress, and made it hard to find the current recommendations, especially for immigrant groups that use only news media from their homeland. Many groups prefer the easily digested, though dramatic, version of news presented by Facebook, which may cause doubt about the accuracy of news media in the host country (Sodemann and Dyhr, 2020). Similar views were also reported by several of our informants in Norway.

In the beginning of 2021, Norway had a population of 5.4 million people, 800.000 of them immigrants. One of the largest minority populations are immigrants from Pakistan and their descendants (Statistics Norway, 2021). A considerable number of these people, particularly the

first generation of immigrants, who arrived in the 70's, are still not sufficiently fluent in the Norwegian language to understand detailed written information documents or a news program in Norwegian. An obvious problem during the initial shutdown and introduction of new restrictions, therefore, was the lack of translated information. Press conferences with national leaders and health authorities were regularly broadcast live on national television (NRK and TV2) with live signed interpretation for the deaf, but without subtitles or live translation into other languages. The official state website with information on new COVID-19 rules was only available in Norwegian until mid-2021, as was the popular information on the websites of national TV stations. As of June 2021, the official COVID-19 webpage at NIPH had texts only in Norwegian and English ([Coronavirus](#)).

During the first weeks of the pandemic, the hospital clinic for undocumented migrants took it upon themselves to translate the most important information into the most common immigrant languages.

HelseNorge ([Coronavirus disease - advice and information](#)), the public health information website, launched a campaign focusing on the use of face masks. This public information website is available only in Norwegian, Saami (indigenous language), and English. Some sections have been translated into simplified Norwegian.

4.5. Are genetics a factor?

Disposition to develop a disease based on genetics is known from e.g. T2DM ([Ramachandran et al., 2010](#)). South-Asians show different patterns in and an increased risk for cardiovascular disease compared to European populations ([Platt and Warwick, 2020](#); [Cainzos-Achirica et al., 2019](#); [Khunti et al., 2020](#); [Wernly et al., 2020](#)).

In Norway, the Directorate of Health is responsible for two nationwide registries – the Norwegian Patient Registry (NPR) and the Norwegian Registry for Primary Health Care (NRPHC) – which together cover all governmental-funded health care, and by that most treatments in Norway. At the outbreak of the pandemic, the Norwegian Institute of Public Health was authorised to put into operation a new Preparedness registry, based on information from these and several other person-identified registries ([Beredskapsregisteret for covid-19](#)).

When analysing a dataset based on these nationwide registries, Indseth et al. ([Indseth et al., 2021c](#)) can find no reason for the higher infection and hospitalization rates for Pakistani immigrants to Norway. British studies find no genetic basis for the increased mortality among people of Pakistani ethnicity in England, referring to socio-economic risk factors and higher incidence rates ([Aldridge et al., 2020](#); [Khunti et al., 2020](#)).

However, genetic susceptibility may not be ruled out as an explanation for the higher incidence rates observed in many countries. Raisi-Estabragh et al., who also use data from the UK, point to risk factors such as BMI, material deprivation and overcrowding as independent risk factors for COVID-19 in immigrant populations, but stress that the differences in COVID-19 infection are not adequately explained. They call for investigation of biological and genetic factors as possibly underlying the ethnic differences ([Raisi-Estabragh et al., 2020](#)). Kjøllesdal et al. in 2022 found lower infection rates in immigrants married to Norwegian-born than in immigrants married to immigrants, demonstrating that this is a complex issue, where exposure and care are important factors ([Kjøllesdal et al., 2022](#)).

Wernly et al. hold that common cardiovascular risk factors and health literacy are the most important factors to manage the public health response towards immigrants during the pandemic, and describe different risk patterns in different populations ([Wernly et al., 2020](#)).

4.6. Strengths and weaknesses

This study has both strengths and weaknesses. Among the strengths, we would like to emphasize the following: As the informants were interviewed at the height of the pandemic in Norway (in the spring of

2021), we believe that recall bias is minimal. Furthermore, the study was developed in collaboration with a representative from a large Pakistani-Norwegian association. On his advice, informants from various age groups and educational backgrounds were included in the study.

Among the weaknesses of the study are: The inability to include a larger number of women, and by that not gaining gender equality. Based on the interviews performed we did not see any difference between men and women. Our interviews took place over the telephone instead of face to face, which may have limited the information we were given. However, this was a necessity because of the COVID-19 regulations at the time. We asked the informants to talk to us on Teams instead, but no informants agreed to this. Neither would they agree to be recorded, so the interviews had to be manually transcribed.

Our informants reside in a geographically limited area, greater Oslo, but this is the area where the great majority of Pakistani immigrants to Norway and their descendants live. Migrants who live outside the Norwegian-Pakistani community could not be reached using our methods.

5. Conclusion

Our data show that Pakistani immigrants in Norway have other norms for physical and social proximity, and that there may have been systematic misunderstandings about infection and infection control measures that lead to an increased infection rate. Mortality, hospitalization rates and infection rates from COVID-19 have been higher for Pakistani immigrants than for the majority populations in the countries studied. Correcting for socioeconomic factors, work, living conditions, lifestyle factors and comorbidities can only partially explain this disparity. More information was found by interviewing the Pakistani population about the challenges they have faced during the pandemic.

Based on our results we can highlight that language barriers could be a factor in the spread of the infection. In addition, interviews with informants from the Pakistani population in Norway indicate that preventive measurements (masks, disinfecting detergent) took unreasonably long time to reach the minority population. Only when information about the devastating effects of COVID-19 (delta mutation) in Pakistan reached the Pakistani minority in Norway, the desired changes in behaviour were observed. Until then required attendance at celebrations and family events in or outside Norway and avoidance of mask wearing remained and participated to spread the infection.

Research is needed to elaborate the contributions of these language and cultural factors that add to the greater risks that COVID-19 pose to the Pakistani minority populations.

Author contributions

U.S.G. and H.L. share first authorship; H.S., A.S. and L.E.B. are responsible for the qualitative part of the data collection. All authors have substantially contributed to the work, read, and agreed to the published version of the manuscript.

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Informed Consent Statement

The study was submitted for ethical clearance and approved by the Norwegian Data Inspectorate (reference 286001 – 2021). In addition, informed consent was obtained from all informants involved in the study. Information about our informants is anonymized and thus, the informants who collaborated with this study cannot be identified.

Data Availability Statement

Statistical data enclosed in the study is retrieved from published material. Qualitative data (in Norwegian) are not available for

confidentiality reasons.

Declaration of Competing Interest

The authors declare no conflict of interest.

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None.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.jmh.2022.100138.

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