Deliberate Self-Harm among the Immigrant Population in Norway:

Insight from Norwegian Population Registers

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Project thesis

Medical studies

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Acknowledgement

Besides medical studies, this project assignment has been done as a part of a Medical study at Oslo University from February 2020 to February 2021.

Growing up as an immigrant in several countries and being a part of an immigrant society has given me several perspectives on both mental health and the act of seeking happiness. I know many immigrants, including refugees, who came to Norway and have gone through various challenges and frustrations while settling down for a new life in this host country. Although most immigrants I know have coped well and become integrated into society, some have developed mental health problems and even committed suicide. I feel the vital need for research to better understand the immigrant population's mental health well-being and, therefore, have chosen to study deliberate self-harm among immigrants in this thesis.

First and foremost, I would like to thank my supervisor, Professor Ping Qin, who helped me develop the research idea and supported me as a compassionate teacher throughout the whole process. She has guided me on how to work and got me on track with great patience. She has made me research systematically and work on a level that I would not achieve without her supervision.

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Sakina Baqeri

Abbreviations and Definitions

DSH Deliberate self-harm

SSB Statistics Norway (*Statistisk sentralbyrå*)

NSSF National Centre for Suicide Research and Prevention **(***Nasjonalt senter for selvmordsforskning og forebygging*)

FHI Norwegian Institute of Public Health (*Folkehelseinstiuttet*)

Immigrant Based on the new definition by SSB*: "immigrants are persons born abroad with two foreign-born parents and four foreign-born grandparents*". (1) Earlier, they were called first-generation immigrants in statistics, but since 2019, this term is no longer in used. Therefore, in this assignment, we use the term*"immigrant*" to refer to the first-generation immigrant as the SSB's definition.

Norwegian-born to immigrant parents *Persons born in Norway with two foreign-born parents and four foreign-born grandparents, by the SSB's definition*(1). Earlier, they were called Second-generation immigrants by SSB, but this term is no longer in used.

Abstract

Background: Evidence has shown that mental health problems are common among immigrant populations. Previous studies from Norway have addressed the suicide rate in immigrants in Norway and the impact of psychological distress and other environmental factors. Deliberate self-harming (DSH) among the immigrants, however, has not been studied broadly.

Aims: In this thesis, we aimed to document deliberate self-harm among immigrants from 2008 to 2018. We wanted to extend our understanding of the DSH-incidents among immigrants in relation to socio-demographic characteristics, and the clinical features of DSH as compared with DSH-incidents by the native population.

Materials and Methods: The data for this thesis were mainly retrieved from four Norwegian national register databases and were interlinked on an individual level. The Norwegian Patient Register (NPR) was used to identify a total of 64 083 episodes of deliberate self-harm, including 5508 incidents by immigrants and 58575 incidents by natives, that were treated by the emergency and somatic specialist health care services. Descriptive analyses were used to profile the characteristics of DSHs in immigrants and compare the differences between DSHs by the immigrants and the natives.

Results: In general, the immigrants had a lower rate of deliberate self-harming than the native Norwegians, but the numbers of DSH-episodes among immigrants increased from 2008 to 2018. Evidently, DSHs in immigrants occurred more often among people of younger age, with lower income and education, and with a psychiatric disorder, especially depression and anxiety disorders, relatively to the DSHs by the natives. The data also showed that immigrants from Asia, especially from Iraq, Iran, and Afghanistan, accounted for a larger proportion of DSH incidents than their proportion of the national population between 2008 and 2018.

Conclusion: Using the data from several national registers in Norway, this thesis provided insights into deliberate self-harming among immigrants and native Norwegians. The observed high level of depression and anxiety among immigrants with DSH emphasizes the importance of health care services tailored to this population segment.

1. INTRODUCTION

1.1 Immigration Worldwide and in Norway

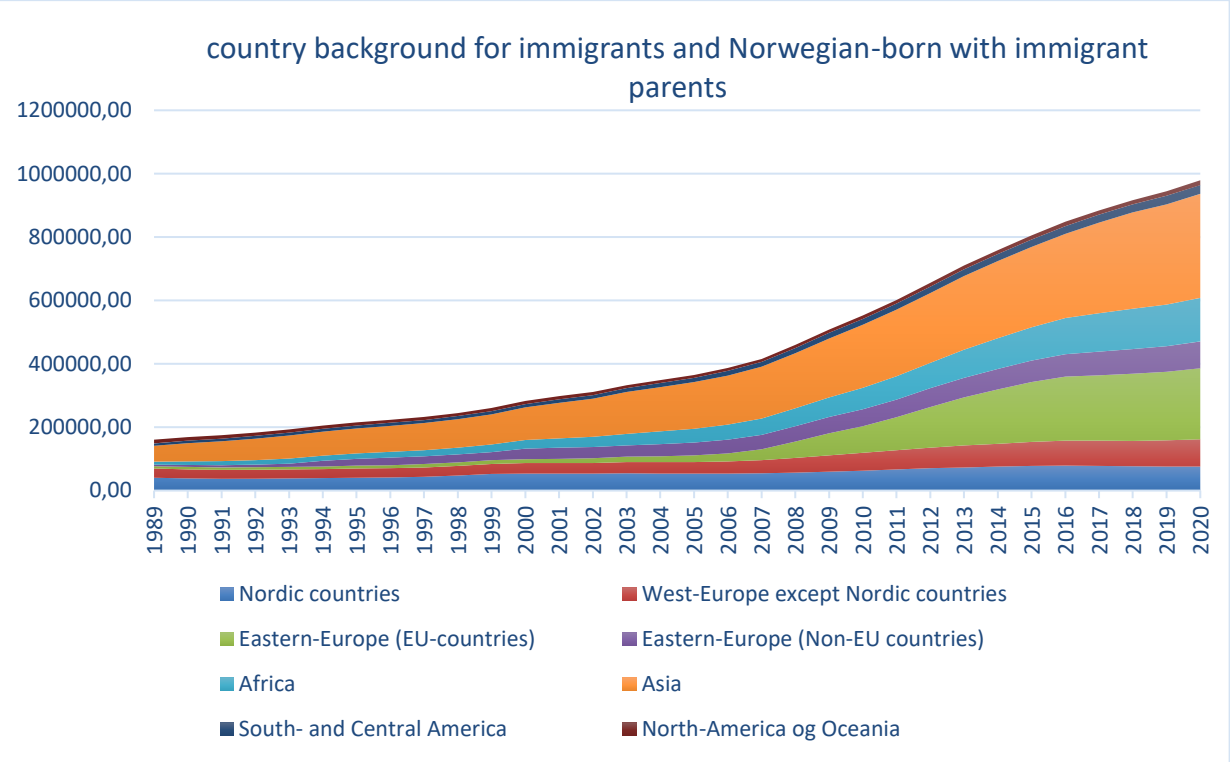
Immigration has been a trending phenomenon in the last decades worldwide, especially in Europe. The UN estimated that the number of international immigrants (people living in other countries than where they are born) reached 272 million in 2019 (2). However, this number accounts for a small percentage (3.5 %) of the total global population. Further the International Migration Report from 2019 (2) shows an average annual immigration rate globally of 2.5 % between 2005 and 2019, compared to 1.5% between 1990 and 2005.

Like other Scandinavian countries, Norway has also seen a steady rise in the immigrant population, especially in the last four decades(3). Among other things, peace, democracy, freedom, and the well-functioning welfare system have made Norway one of the countries scoring highest in the UN's World Happiness Report of 2019 (4) and an attractive destination to many immigrants. (See Figure 1)

According to Norwegian Statistics (SSB) (5), Norway has a population of around 979 000 with an immigration background, including immigrants[1] and Norwegian-born to immigrant parents. This number corresponds to approximately 18% of the total population in Norway. Therefore, researching and studying this population segment is essential to get a comprehensive picture of Norwegian societal health.

[1] Previously referred to as *first-generation immigrants* (see Abbreviations).

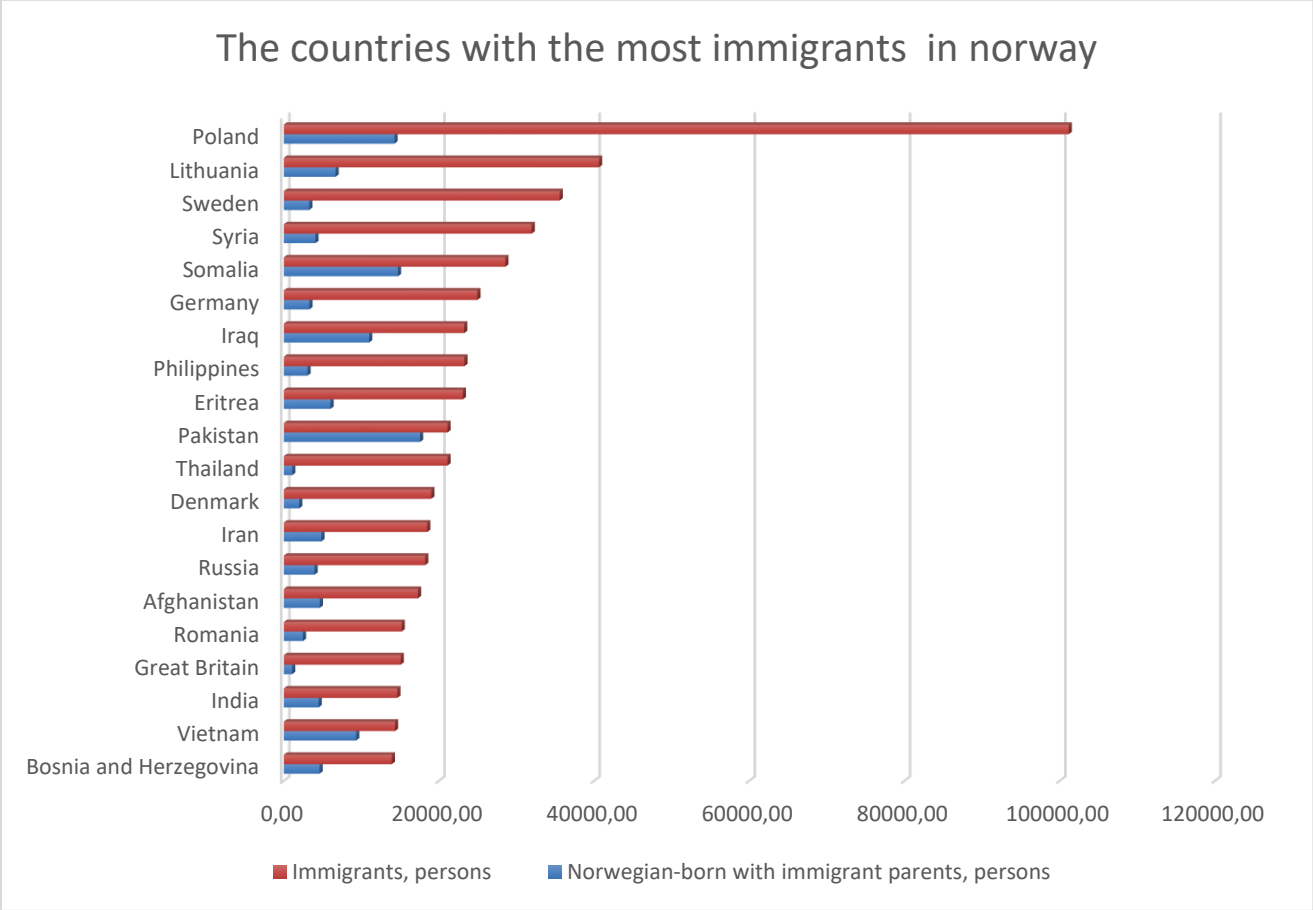
Figure 1. An overview of immigrants and Norwegian-born with immigrant parents in Norway, based on their country background, shows a steady increase in the population's number in the last 30 years**.** (Source: Statistics Norway, 2020)



There is a steady growth of immigration to Norway from all over the world (Figure 1). The largest increase of immigrants has been from Europe and Asia, a pattern subject to rapid changes over the past few decades. For example, more people are originating from Asian countries in Norway now than before, which may be explained by changes in the political and economic situations around the world, according to a report published on Pew Research Center (6).

After several immigration waves to Norway, we have a heterogeneous combination of immigrants from different countries with various residence time, extending from weeks and months to several decades. This fact should be considered when we talk about immigrants in this thesis. As illustrated in Figure 2, most immigrants living in Norway today are from Poland, Lithuania, Sweden, Syria, and Somalia, while the Norwegian-born to immigrant parents typically have families originating from Pakistan, Vietnam, and Iraq.

Figure 2. Immigrants and Norwegian-born to immigrant parents in Norway, by Country background**.** (Source: Statistics Norway, 2020)



Immigrants live in different parts of Norway, but most of the immigrant population is concentrated in and around large cities like Oslo, Bergen, and Trondheim (7).

In 2016 a survey investigating immigrants' general living conditions' in Norway by the SSB (8), indicated a lower, which indicated a lower educational level among immigrants and fewer immigrants in higher job positions requiring a higher education level than the population as a whole. Interestingly, there were also observed disparities across the origin countries of immigrants. The study concluded that the marriage rate among immigrants was higher than in the rest of the population. Almost two out of three immigrants reported that they were either married or cohabiting (8). The survey also revealed that immigrants more often feel lonely than what was reported by the general population, and that differences in how frequently immigrants contact family or friends could be linked to their country of origin.

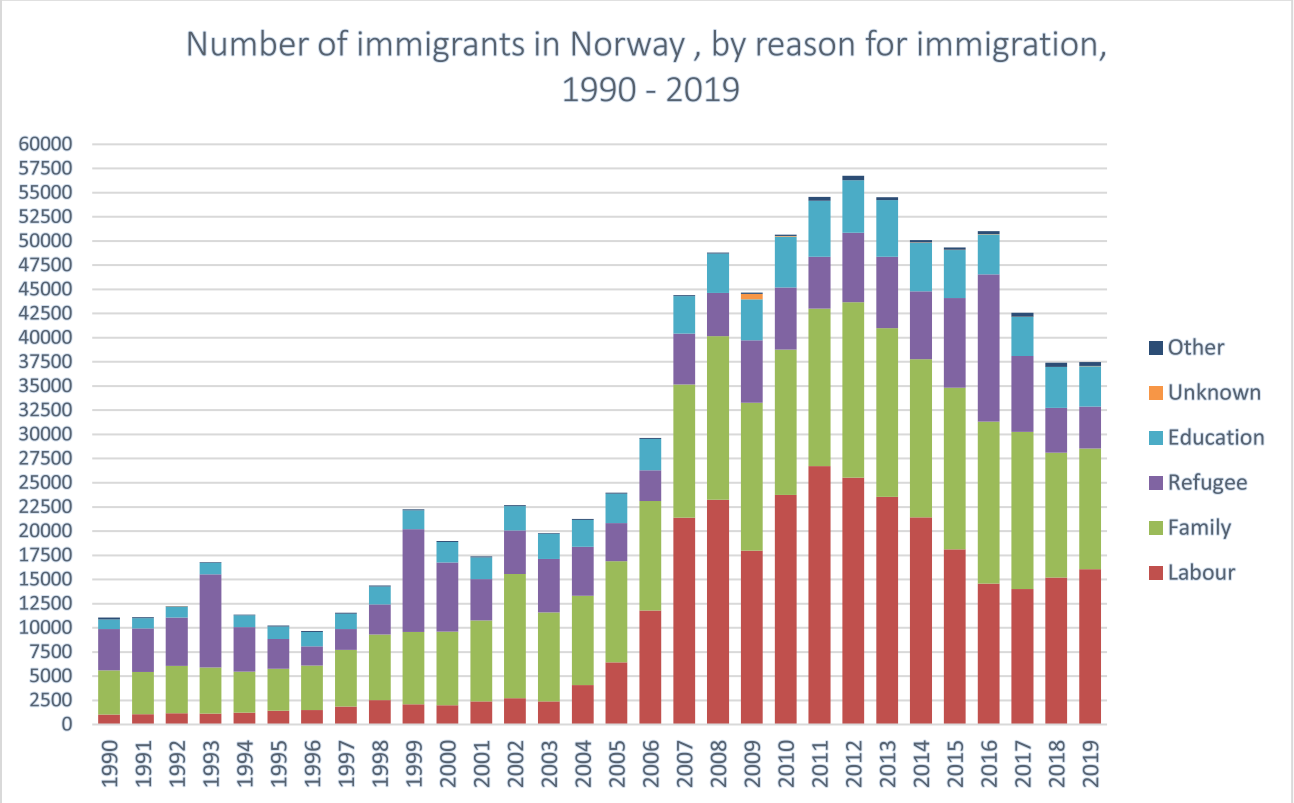
In another yearly report from SSB in 2019 (9), the percentage of employed immigrants (incl. all non-native Norwegians) was estimated to around 67%, while it was 78.5% among the non-

immigrant population. This distribution was consistent with the higher registered unemployment rate among immigrants (7.7%) compared to the general population's unemployment rate (3.7%), in 2019. The statistics also generally show a lower income among immigrants compared to Norwegian-born persons to immigrant parents and non-immigrants (3).

1.2 Why Are Immigrants Coming to Norway?

Since 1990, Norway has received approximately 907 000 immigrants (3). The majority has come as labour immigrants due to immigration waves. Two outstanding examples are the relatively large number of people from Pakistan early in the 1970s, and then from Sweden, Poland, and Lithuania in the last decades, after EU-agreements in 2004 (10). The other large portion of the immigrant population has come due to family reunions and as refugees[2]. A small proportion has immigrated to Norway via scholarships or for other reasons (Figure 3).

Figure 3 –Number of immigrants in Norway, by reason for immigration, 1990-2019. (Source: Statistics Norway, 2020)



[2] People who have fled war, violence, conflict, or persecution and have crossed an international border to find safety in another country, defined by UNHCR. (The UN Refugee Agency, Citated January 2021)

Statistics further indicate that European citizens come to Norway mostly for work, while people from Asia and Africa usually come to Norway by family unification or as refugees (10).

As mentioned previously in this thesis, the number of immigrants, especially refugees, increased between 2014 and 2017 in Norway and Europe. This period was widely referred to as the *Migrant Crisis in Europe*, and it was partly the result of lasting war and conflicts in the Middle East and North Africa, according to the News channels like BBC (11). Increasing violence, economic difficulties, political challenges, and other so-called push factors[3] are speculated to explain such large-scale immigration, as stated in an article published by BBC News (11). That means while some immigrants move in search of work, study or reunification with their families, other immigrants, move in search of safety and a stable life (11). In relation to refugees[4], the *Migration Data Portal* comes with facts that can help us provide a perspective on the current topic:

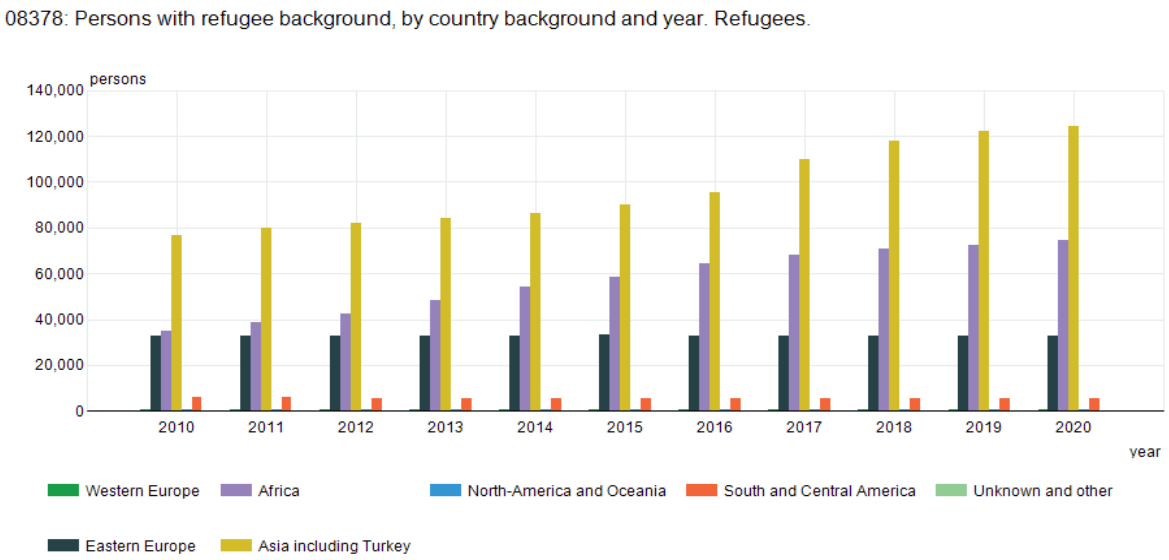
> Since 2015, with the so-called "refugees and migrant crisis", Europe has dealt with increasing asylum seekers' numbers. 2.4 million refugees and people in refugee-like situations and 860 thousand asylum-seekers (pending cases) were hosted in the EU-27 Member States at the end of 2018. (12)

According to SSB (13), around 173 000 immigrants of 907000 immigrants in Norway, are refugees, which corresponds to 19% of all immigration to Norway. A total of 4.4 % of the Norwegian population has a refugee background. This information is of interest when we talk about immigrants' mental health and environmental factors that negatively affect their mental health.

In the next part, we look at the immigration process and its effect on mental health.

[3] The condition(s) or circumstance(s) in a country of origin impels or stimulates emigration. (According to European Commission)

Figure 4. According to this diagram, more refugees from Asia and Africa have come to Norway, in the last ten years, especially after 2015**.**



Source: Statistics Norway

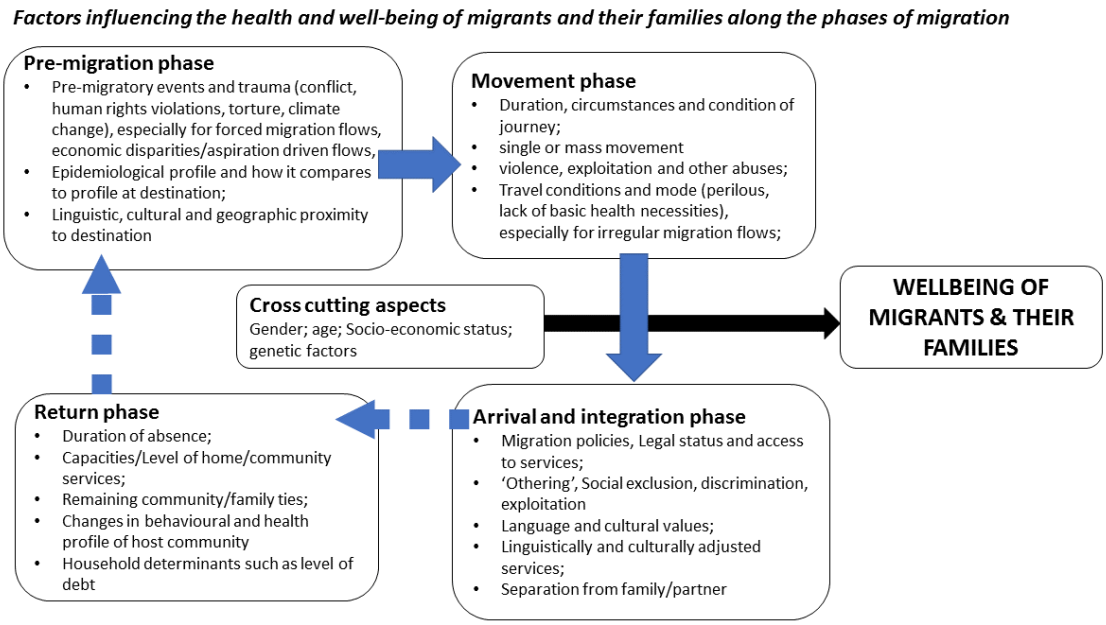
1.3 The Migration Process Can Affect Mental Health

It is known from earlier that genetic disposition and environmental factors impact mental disease but to different degrees. A study published on Acta Psychiatrica Scandinavica in 2004 (14) shown that the immigration can be a stress-inducing phenomenon which may trigger mental illness. Refugees, as well as other immigrants, can have experienced difficult circumstances such as conflict, insecurity, loss, or other traumas that can increase their vulnerability to mental issues, as demonstrated in a study by Krimayer et al. (15). However, the nature of the exposure and experiences, as well as a person's vulnerability and resilience, which are also influenced by previous experiences, will vary for each individual (15).

The *IOM's* [5]*Global Migration Data Analysis Centre* (GMDAC) constructed a model (16), which illustrates the relation between psychological stress factors linked to the immigration process. (see Figure 5) According to this model, the immigration process is divided into four phases: *pre-migration*, *movement*, *arrival- and integration*, and *return phase*. Each of these phases can be associated with various stressors and risk factors for developing mental health problems. In what follows, we will take a closer look at each of these phases.

[5] International Organization for Migration.

Figure 5. Factors in the four phases of immigration can affect the health and well-being of an immigrant**.** (Source: MigrationDataPortal.org)



In the *pre-migration phase*, immigrants can often be exposed to several stress factors. These possible stressors encompass conflict, traumas related to climate change, torture, an unstable economy, or other stressful events. These factors can lead to mental health issues and trigger mental disorders with common symptoms such as hopelessness and anxiety.

During the *movement phase*, some immigrants can experience difficulties and stress related to the journey's conditions, especially for illegal immigrants who take a dangerous route to come to Europe or other destinations. During the journey, some immigrants may face violence, exploitation, loss of friends or families, or other forms of abuse (11). Such experiences combined with or without individual experiences in the homeland can increase the risk of mental illness. For example, a study in Sweden (17), detected an observed increased risk associated with mental unhealth among refugee women, compared to non-refugee.

During the arrival- and integration phase, when the immigrants arrive at the destination country, they may face further challenges. These challenges include language and cultural barriers, as well as other difficulties, making the integration tough. For some immigrants getting hold of necessary documentation and permits are worries while other immigrants can

have difficulties to deal with the loss of social network. A report by the OECD[6] from 2013 (18) supports the assertion that discrimination is one of the crucial obstacles that hinder immigrants' integration into society and joining the labour market. This report reveals that immigrants will more often than other citizens experience social exclusion, discrimination, or abuse.

Regarding to the *return-phase*, immigrants who are sent back or return to the home country, may experience that the conditions in homeland have changed, which can make it difficult for them to cope with the new circumstances.

1.4 Other Risk Factors to Mental Distress

Aside from psychological distress, other aspects such as socio-economic factors, integration difficulties, the culture of origin, and social network loss can also influence immigrants' mental well-being. These factors are briefly mentioned here.

As mentioned earlier in this paper, some immigrants can experience psychological distress associated with resettlement. This association is indicated in a study done by A. Malm et al. (19) , which discussed post-migration stress among Syrian refugees in Sweden. In the study they list some of those difficulties as follows:

> Perceived discrimination, low host-country skills, separation from family and friends, uncertainty relating to asylum application, financial difficulties and unemployment, lack of private accommodation, social isolation, loss of status, poor social support, and conflicts between spouses or parents and children (19).

Another study by Q. Puzo et al. (20) in Norway revealed a connection between the socio-economic status and the immigrants' physical and mental well-being. Q. Puzo and colleagues conclude that immigrants with higher education levels or higher paid occupations generally have better mental health. Furthermore, their research shows that risk factors such as lack of social network, low income and lower educational attainment level are associated with higher suicidal rates, both in the native Norwegian population and immigrant populations (20).

[6] Organization for Economic Co-operation and Development.

1.5 Mental Health Problems among Immigrants; Suicidal Behaviour as an Example

Mental illnesses and self-harming can be the outcome of experiencing psychological distress combined with genetic factors. According to the WHO, depression is one of the leading causes of disability in the world (21). The WHO reports that that in 2017, approximately 300 million people with depression were registered worldwide. That is a prevalence of more than 3.8% of the world's population, and most of the cases were reported by women. A random-effects model meta-analysis done with data from PubMed (22) calculated a prevalence of 15.6% of immigrants with depression globally. According to these two sources above, one possible implication is that there is a four times higher occurrence of depression among immigrants than in the general population.

On the national level, a report from FHI in Norway (23) confirmed that newly arrived immigrants appear to be susceptible to developing depression. Adult immigrants from war- and conflict zones and children and adults with immigrant background reported more mental health problems than the general population. As an example, for mental health issues, we take a look at the suicide rate among immigrants.

WHO reports the following “Suicide is the second leading cause of death among 15-29-year-olds. People with severe mental health conditions die prematurely – as much as two decades early – due to preventable physical conditions” (24)

In Norway, Q. Puzo et al. performed a study (25), which showed that the risk for suicide was generally lower for immigrants than native Norwegians. Puzo et al. did however, find differences in each immigrant groups based on factors such as residence time and origin country. Factors like increased resilience, religion, or culture were mentioned as influencing factors on the suicide rate among immigrants. Additionally, this study adds that suicide risk increased proportionately with time spent in immigration countries.

Based on the studies mentioned above, we can conclude that some protective factors help immigrants deal more effectively with stressful events in their lives, such as resilience, comfort in faith, inclusion, and more social contact as a cultural factor. However, they are also more exposed to stress and generally have a higher risk to develop mental illness which makes it important to take it into the consideration. As WHO reports, mental and neurological

diseases correspond to 10% of diseases burden globally, and people who have a severe mental illness usually die 10-20 years earlier than others (26).

These findings make mental health an important theme and working towards preventing mental illness or treatment will give substantial changes in public health.

1.6 Summary

In short, immigrants in Norway, as well as in other countries, settle down in a new country for different reasons. They are from different origin countries with diverse backgrounds and experiences, and they may have been facing various challenges during the migration process. In the host country, challenges such as language barriers, low social status, and the lack of social network can affect the integration process. The lack of integration, combined with other environmental aspects, can influence their ability to seek help and affect their mental health.

To date, several studies have reported an increased risk of mental unhealth among people with an immigrant background. It has been suggested that the issues related to immigration and previous individual experiences causes an accumulation of risk factors for mental illness, leading to severe consequences such as deliberate self-harming and, in a worst-case scenario, suicide. Suicide and DSH has been studied among immigrants and their children in Norway earlier, but looking at specifical immigrants who came to Norway in the last two decades has not been studied extensively. Since the immigrant population in Norway consist of a heterogeneous group, splitting them into smaller groups and getting a closer look at each group seems necessary to better understand immigrants' mental health.

In this thesis, we want to study deliberate self-harm and take it as an example to see how deliberate self-harming behaviours in immigrants differ from that of native Norwegians. Hopefully, the study can provide us with more knowledge of immigrants' mental health, specifically the DSH, and contribute to a better mental healthcare service for this segment of the population in Norway.

2. AIMS OF THIS THESIS

This project assignment will mainly focus on deliberate self-harm (DSH) among immigrants who have come to Norway from 2008 to 2018. More precisely, it aims to answer to following questions:

1) How many DSH episodes treated in specialist healthcare are by immigrants per year, and if there are any changes in the episodes overtime during the study period?
2) Are there gender and age differences in DSH incidents by immigrants as compared with DSHs by native Norwegians?
3) Are there any differences in socio-economic status (e.g., income, education, place of residence) between immigrants and the natives when the DSH happened?
4) How often do DSH episodes by immigrants occur in the presence of psychiatric disorders?
5) Are there any differences in types of psychiatric disorders involved in DSH between immigrants and native Norwegians?

3. MATERIAL AND METHODS

3.1 Data Sources and Study Subjects

The data for this assignment were retrieved from several national registers and were interlinked on an individual level.

1. The *Norwegian Patient Registry* (NPR): The NPR is one of the central health registers in Norway established in 1997 by the Ministry of Health and Care Services. It is administered by the Health Directorate and collects information about all patients who have been or are waiting for treatment within the specialist health service in Norway. The personalia, medical information, administrative and social information are examples of what becomes registered and collected in NPR (27). Each hospital presentation for DSH, registered in the Norwegian Patient Register during 2008–2018, comprises this study's basis.
2. The *Central Population Register*: It is a national database that contains information about all persons who reside or have resided in Norway and is administrated by the Norwegian Tax Administration. This register contains crucial information for all residents, e.g., personal identification number, birth date, sex, parental identifiers, birthplace, date of immigration, address, deaths, and citizenship. The personal identification number is key to be used for data linkage across different registers. (28). For this assignment, general personal information such as age, sex, birth country, immigrant status, and residence place were obtained from this register.
3. The *StatisticsNorway's Events Database* (FD-Trygd): It is a database containing longitudinal information on demographic and socio-economic factors and administered by SSB. This information includes payments of social benefits, employment, or job searching (29). The database was used to retrieve personal data on marital status, income, and education in this study.

3.2 Study Design and Population

This assignment is based on all immigrant population in Norway. The focus of study interest is all episodes of DSH presenting to specialist healthcare services (i.e. somatic hospitals and emergency centres) from 2008 to 2018 by the immigrant population. For the purpose of comparison, all DSH episodes by the native Norwegians were also included. These DSH

episodes were identified from the Norwegian Patient Registry (NPR). For a more detailed description of identifying DSH-cases and selecting procedures, you can read in an earlier publication by P. Qin and colleagues (30).

3.3 Variables of Interest

3.3.1 Immigration background

As purposed in this thesis, the population with DSH-incidents was categorized into two groups, based on Statistics Norway's (SSB) definitions.

1. *Native Norwegians*: Norwegian-born to two Norwegian-born parents
2. *Immigrants*: (earlier called; first/generation immigrants) Foreign-born to two foreign-born parents

(According to SSB's definition, first-generation immigrants physically come to Norway from another country and live in Norway. It does not include those children who are born in Norway to immigrant parents. They are called *Norwegian-born to immigrant parents*(1).)

3.3.2 Age, gender, and calendar year

Age refers to which age the person had when he or she had an episode with self-harming. The age was categorized into three age groups "10-34 years old", "35-64 years old", and"65 years old and above"). Variable" gender" refers to the sex of persons with DSH-episodes, "male" or "female". The "calendar year" was represented by each single calendar year from 2008 to 2018.

3.3.3 socio-economic factors

This thesis's socio-economic factors included marital status, education attainment, Place of residence, and annual income.

- ***Marital status***

The cases were categorized by marital status in categories as "married", "single", "separated, divorced, widowed", and "unknown marital status".

- ***Educational attainment***

This variable included only education achieved in Norway and was categorized into three primary groups: "tertiary education" (collage, university, or higher education), "intermediate education" (upper secondary or post-secondary education), "compulsory education" (primary or lower secondary education), and "unknown education".

- ***Annual Income:***

This variable's division was based on the annual income compared to the G-value in the year where DSH-episodes happened. The annual income includes pensions, wages, property income, and income from other registered sources. In Norway, G-value (Grunnbeløpet i folketrygden) is a national insurance scheme basic amount, and the amount is adjusted yearly to reflect the basic need and inflation (31). For example, G-value in 2008 was ca. 70 000 KR per year, and in 2018 it was on ca. 96 000kr per year.

Based on the G-value, the categories were "under 1G", "over 1G", "over 2 G", "over 3 G", … and "unknown income".

- ***Place of residence:***

Place of residence was classified into five categories, based on the division of Norway into five geographical country regions, according to the 2020 county reform. These categories were "Eastern Norway", "western Norway", "Central Norway", "southern Norway", and "Northern Norway".

3.3.4 Clinical characteristics of DSH

Order number of DSH tells the number of recorded DSH on the same patient, and it was divided into "1st DS", "2nd DS", "3rd -5th DS", "6-10th DS", and"10th or more DS".

Comorbid psychiatric illness: Based on the recorded primary and secondary diagnoses in the DSH, having a diagnosis within 'F00-F99' was considered "With psychiatric diagnosis" otherwise, "No psychiatric diagnosis".

In order to a closer overview of mental problems, we chose to look at the most common psychiatric conditions (defined by ICD-10-system) of the following specific diagnostic groups:

"Alcohol misuse disorder", "Substance misuse disorder", "Schizophrenia spectrum disorder", "Depression/affective disorders", "personality disorders", and "stress/anxiety disorders".

3.4 Statistical Analysis

Descriptive analysis was conducted to profile the DSH episodes. Chi-square test was used to examine the differences between DSH episodes by the immigrants and those by natives. All tests are two-tailed, and a p-value large than 0.05 was considered significant.

4. RESULTS:

4.1 Deliberate Self-Harm among Immigrants in Norway; Between 2008 and 2018

In total, 64 083 episodes of DSH that received emergent treatment in somatic specialist health services between 2008 and 2018 were included for this study. Of these episodes, 8.6% (N=5508) of incidents were by immigrants, while 91.6% (N=58575) were by the native Norwegians.

The number of DSH-episodes among the immigrant population significantly increased during the study period. The number of incidents rose from 440 cases in 2008 to 559 cases in 2018, which corresponds to an increase of approximately 27% (Table 1).

Table 1. Yearly episodes of DSH-episodes treated at specialist healthcare services in immigrants and native Norwegians, 2008-2018.

Calendar year	Native Norwegians		Immigrants	
	Number (N)	**%**	**Number (N)**	**%**
2008	5567	9.50	440	7.99
2009	5463	9.33	442	8.02
2010	5280	9.01	474	8.61
2011	5487	9.37	461	8.37
2012	5501	9.39	514	9.33
2013	5556	9.49	508	9.22
2014	5209	8.89	551	10.0
2015	5327	9.09	492	8.93
2016	5122	8.74	528	9.59
2017	5071	8.66	539	9.79
2018	4992	8.52	559	10.15

However, when comparing these figures to the growth in immigration, which increased from 8% to 14% during these ten years (according to SSB), we find that the level of DSH-episodes among immigrants has been mostly stable this period. When it comes to the native Norwegians, the number of DSH incident episodes did not change dramatically, with 5000 to 5600 DSH-episodes per year (Table 1).

4.2 Differences in DSH-incidents of Immigrants and Native Norwegians, with respect to Gender, Age, and Socioeconomic Factors

During the period 2008 to 2018, there was significantly more DSH episodes among females (over 60%) than males (under 40%). There were no significant gender differences between native Norwegians and immigrants related to *gender* (Table 2).

Table 2. Sex and age distribution of DSH incidents in immigrants and the natives, 2008-2018.

	DSH by Native Norwegians		**DSH by Immigrants**		**Test of differences**
	Number	%	Number	%	
Gender					
Male	22 521	38.45	2176	39.51	χ^2=2. 38 P= 0.12
Female	36 054	61.55	3332	60.49	
Age					
10-34 years old	27197	46.4	3003	54.5	χ^2= 478.6 P<0.001
35 -64 years old	233567	40.2	2186	39.7	
65 + years old	7811	13.3	319	5.8	

Concerning the *age*, the percentages of DSH-incidents differed significantly, depending on the immigrant background. There was a higher incidents ratio among younger immigrants (under age 35) approx. 54.5%, compared to the younger native Norwegians, approx. 46.4%. By contrast, the number of DSH-episodes among people over the age of 35 was higher within the native Norwegian group (13.3%) than within the group of immigrants (5.8%) (Table 2).

The reasons for such patterns of self-harming related to age can be multiple and debatable. Some speculations and possible explanations are roughly named in this thesis, under the discussion part.

Marital status was also a factor that had a significant impact on DSH-rate. Having status as "single" was highly associated with self-harming in both studied groups. However, a status of being "single" appaired to be somewhat more common among natives (N= 36791, 62.8 %) in comparison to immigrants (N= 2604, 47.3%), while a status of being married was more frequent in DSH immigrants (N= 1491, 27.1%) than the native Norwegians with DSH (N= 7727, 13.2%) (Table 3 on the next page).

Another socio-economic factor, which was also taken into consideration, was *educational attainment*. The risk of harming self deliberately appeared proportional to the educational level in both groups, meaning that a lower educational level was associated with a higher risk for DSH. However, the distribution of education differed significantly between the two groups (see Table 3). In short, there were relatively more DSH-incidents by natives with only compulsory educational attainment (55% of DSH-cases) than that by immigrants with the same educational level (44% of DSH-cases), and relatively more DSHs in immigrants with high education.

Nevertheless, it is essential to mention that there were many immigrants with no or unknown educational attainment level (ca. 24%), making the conclusions difficult to interpret. These results are discussed in more detail in the discussion part of this thesis.

Regarding *income* (Table 3), it is important to clarify that the income-categories considered here are based on taxable income related to the G-values for each year when the DSH-cases were registered. Additionally, it is notable that the poverty line lays around 2 G in Norway (32).

Overall, there was a significantly higher number of DSH-incidents among immigrants with lower income than the natives with the same income level ($p<0.001$). Approximately 24% of the total DSH-cases among immigrants were reported by whose annual income level was below 1 G, while among the native Norwegians, this number was around 15%. There were also some noticeable differences in the other income-levels. Together these results indicate a trend of a higher percentage of DSH-cases among immigrants with low income (under the poverty line) in comparison to the native Norwegians.

Finally, we examined whether the *Place of residence* differentiated the DHS-incidents in immigrants versus the natives. These numbers must be seen in the light of the actual population size of natives and immigrants for each region.

Generally, most DSH-cases were registered in Eastern and Western Norway (over 70% of cases), where the largest portion of Norway's population resides(33). There were significant differences between the two groups of study. For example, of the total DSH-episodes among the immigrants, 61% (N=3367) were registered in Eastern Norway, including Oslo, while for the native Norwegians, the corresponding percentage was ca. 47% (N= 27407) of all DSH-cases. In contrast, a higher number of DSH-cases among the native Norwegians were reported in Western Norway (N= 15865, 27%), whilst that number was 21% (N= 1144) for the immigrants (Table 3).

To sum up the results on socio-economic factors, lower-income had a more considerable impact on the risk of DSH-incident among immigrants than among the native Norwegians. Both the educational level and having single-marital status impacted the DSH-rate; however, the impact was more noticeable among the natives than immigrants. In Eastern Norway, including Oslo, the DSH-ratio were higher for immigrants than the native Norwegians.

Table 3. Distribution of socio-economic factors among the natives and immigrants presenting specialist healthcare because of deliberate self-harm in Norway.

Socio-economic status	Native Norwegians		Immigrants		Test of difference
	Number	%	Number	%	
Marital status					
Married	7727	13.19	1491	27.07	χ^2=1106.9, P<0.001
Single	36791	62.81	2604	47.28	
Separated, Divorced, or Widowed	14056	24.00	1259	22.86	
Unknown marital status	1	0.00	154	2.80	
Educational attainment					
Tertiary education	5722	9.77	778	14.12	χ^2=3697.1, P<0.001
Intermediate education	17807	30.40	1103	20.03	
Compulsory education	32308	55.16	2252	40.89	
No education or unknown	2738	4.67	1375	24.96	
Place of residence					
Eastern Norway	27407	46.79	3367	61.13	χ^2= 459.5, P<0.001
Western Norway	15865	27.08	1144	20.77	
Southern Norway	4093	6.99	362	6.57	
Central Norway	4559	7.78	290	5.27	
Northern Norway	6243	10.66	310	5.63	
Unknown	408	0.70	35	0.64	
Gross annual income by G					
Income under 1 G	9064	15.47	1327	24.09	χ^2= 2212.8, P<0.001
Income over 1 G	6520	11.13	812	14.74	
Incomer over 2 G	19194	32.77	1141	20.72	
Incomer over 3 G	12078	20.62	881	15.99	
Income over 4 G	5759	9.83	577	10.48	
Income over 5 G	2938	5.02	282	5.12	
Income over 6 G	1336	2.28	141	2.56	

Incomer over 7-9 G	1150	1.96	101	1.83	
Income over 10 G	489	0.83	47	0.85	
Income missing	47	0.08	199	3.61	

4.3 Clinical Features of DSH-incidents by Immigrant Background, the Repeats of Episodes, and Psychiatric Comorbidity.

When looking at the *Order number of DSH* (Table 4), there were significantly more repeated DSH-incidents among the natives relative to the immigrants. More than 79% of DSH-cases in immigrants were registered as the first time DSH-incident, while the corresponding figure was ca. 60% of the total DSH-cases among the native group. Overall, these results indicate that the native Norwegian group had more DSH-repeats that got emergency help than immigrants.

Giving the strong relationship of DSH with a psychiatric problem, we examined psychiatric disorders that were reported when the DSH was treated. During the study period of 2008 to 2018, there was a significantly higher number of DSH-cases linked to pre-existing psychiatric disorder as being reported in patients of the natives (ca. 57%, N=33690) compared to immigrants (ca. 47%, N=2605).

Furthermore, there were also significant differences in specific psychiatric diagnostic groups between the two groups. There was a significantly higher occurrence of alcohol misuse among natives being treated for DSH (16 %, N=9501) compared to the immigrants (11.6%, N= 638). The same trend was actual for substance misuse, where the percentage of DSH-incidents with substance misuse among the native Norwegians was ca.10 % (N=6029), and for immigrants, this was ca. 7% (N=411).

However, if we turn to schizophrenia and spectrum disorders, we observed no significant differences between these two population groups. Schizophrenia disorders were associated with self-harming at the same rate in both groups, with 2.7% among immigrants and 3% among natives (P= 0.63). Regarding stress-related disorders and anxiety, it was not significantly but marginally higher among immigrant DSH-cases than the natives (6.7% vs 6.0%, P=0.068). When we were looking into depression and other affective disorders, we observed a significantly higher rate among the immigrants (N=1124, 20.4%) than the natives

(N=10429, 17.8%). Another interesting finding was that personality disorders were seen more frequently among native Norwegians (N= 5489, 9.4%) than the immigrants (N=144, 2.6%).

Table 4. Clinical features of DSH-incidents by immigrants and the natives.

Psychiatric Disorder	DSH of the natives		DSH of immigrants		Test of difference
	Number	%	Number	%	
Order number of DSH					
1st DSH	35419	60.47	4389	79.68	χ^2=976.4 P<0.001
2nd DSH	8129	13.88	652	11.84	
3rd -5th DSH	7053	12.04	335	6.08	
6-10th DSH	3266	5.58	85	1.54	
10th or over DSH	4708	8.04	47	0.85	
Diagnosis of psychiatric disorder					
No psychiatric diagnosis	24 885	42.5	2 903	52.7	χ^2=214.16 P<0.001
With psychiatric diagnosis	33 690	57.5	2605	47.3	
Specific diagnostic groups					
Alcohol misuse disorder	9501	16.2	638	11.6	χ^2=81.28 P<0.001
Substance misuse disorder	6029	10.3	411	7.5	χ^2=44.63 P<0.001
Schizophrenia spectrum disorder	1735	3.0	157	2.7	χ^2=0.22 P= 0.63
Depression/affective disorders	10429	17.8	1124	20.4	χ^2=23.07 P <0.001
Personality disorders	5489	9.4	144	2.6	χ^2=286.66 P <0.001
Stress/anxiety disorders	3583	6.1	371	6.7	χ^2=3.33 P= 0.068

We turn back to some of these findings and discuss them more closely in the discussion part. In short, alcohol and substance misuse and personality disorders had higher occurrence among the natives with DSH, while depression and other affective disorders and anxiety and stress-related disorders were a more common comorbid condition among the immigrants with DSH.

4.4 DSH among the Immigrants by Birth Country

We also studied the incidents by birth country to get a picture of the distribution of Deliberate self-harm within immigrants and if there were some differences based on their background. It is necessary to mention that the numbers in Table 5 are based on "persons" with deliberate self-harming and not "incidents" as it has been in the earlier tables and results).

Based on SSB data, combined with the present study's data, we observed a higher DSH- Rate ratio among immigrants from South and Central America (RR =1.56) and Asia (RR=1.3), compared to immigrants from other continents.

Immigrants from Poland had the highest number of deliberate self-harming (368 persons) among all immigrants in Norway, at the country level. However, if we evaluate these numbers related to the immigrant population from different origin-countries in Norway, we get another image (Table 5). The calculated Rate ratio showed that immigrants from Asian countries such as Iran, Iraq, and Afghanistan were overrepresented concerning deliberate self-harm (RR>2.0) than immigrants from other countries between 2008 and 2018.

Table 5. Immigrants with DSH by birth country; top 10 countries with a high number of persons with DSH, 2008 -2018.

Birth Country	Person with DSH	% of total immigrants with DSH	Number of immigrants from the country, 2018*	% of total immigrants, 2018	Rate ratio (RR)**
By Continents					
Europa	1865	42.49	390 375	52.28	0.81
Asia inc. Turkey	1759	40.08	227631	30.49	1.31
Africa	495	11.35	93735	12.55	0.90
South and Central America	199	4.63	22171	2.97	1.56
North America	60	1.37	10580	1.42	0.96
Oceania	8	0.18	2169	0.29	0.62
By Country					
Poland	368	8.38	98211	13.15***	0.64
Iraq	319	7.27	23107	3.09	2.35
Iran	270	6.15	17720	2.37	2.59
Afghanistan	227	5.17	16776	2.25	2.30
Sweden	309	7.04	35820	4.80	1.46
Thailand	161	3.67	19513	2.61	1.40
Denmark	151	3.44	19275	2.58	1.33
Pakistan	146	3.33	20383	2.72	1,22

*Number of immigrants for 2018 are retrieved from SSB, January 2021(34) (35).

** RR (Rate ratio): (% in total immigrants with DSH)/ (% in total immigrants), as ex. Rr for Europe = (42.49/52.28) = 0.81. The RR for countries were calculated in the same way.

*** The number of persons with DSH /The total number of immigrants from this country. Ex. Poland: 98211/746 661= 13.15.

5. DISCUSSION

5.1 Methodological Considerations

5.1.1 The use of registers as the data source

Using data from national registers make the results more precise and trustworthy because the data are objective and not subjective as an interview-based report usually are. A systematic linkage between national longitudinal registers by identification number makes it possible to cover multiple information fields for each case in this study. This range of information access makes us able to study a large population on a national basis and across different perspectives.

The data used as a source for the present study were not collected to propose a specific and aimed research project, making the risk of differential misclassification bias minimal.

According to access to all information we wanted, some limitations have been with our register-based data because data on databases were not included for this study or did not exist for some variables. For instance, we could not get information for other existing variables such as the previous help-seeking in psychiatric health care (not necessarily having a diagnosis), how long they lived in Norway and their reasons for immigrating to Norway. This information could give a clearer picture of which groups of immigrants are generally more representative of deliberate-self harming or mental unhealth. Moreover, the DSH cases derived from NPR represent DSH incidents in severe form, leaving many DSHs in mild forms or untreated cases uncovered.

5.1.2 Study design and statistical methods

This is a descriptive study based on all cases with DSH-diagnosis registered by emergency and special health care services in Norway over a specific period (2008-2018). Comparisons were made between DSH- incidents by the immigrant population and those by the natives. This study design is simple and efficient for the purposes of this assignment but does not have the capacity quantifying the strength of the association that the study variables may have with the risk of DSH in the study population.

5.2 Discussion of the Key Findings

What follows here is a discussion of several findings in this thesis.

DSH-incidents by immigrant background

The present study results indicate that DSH-incidents by people with an immigrant background constitute approximately 9% of total DSH-incidents who got help in somatic health care between 2008 and 2018 and included in this study. This percentage was almost stable during the years from 2008 through 2018 (between 7% and 9%), while the immigrant population had grown from 10% to 14% during this period. In that respect, there was expected more incidents than recorded among immigrants.

DSH-incidents by age

The findings on the age-variable show that the younger immigrants struggle more than older immigrants, while among natives, there is also a noticeable percentage of older people being treated for DSH. This figure can be explained by the dissimilarity of the population compositions in each population group to some degrees. Characteristically, there are more older natives in Norway than older immigrants because, as mentioned earlier, most immigrants come as labour force, refugees, or for study. It makes a younger population of immigrants than the native people, which enumerate several generations of Norwegians.

DSH-incidents by Place of residence

Due to results, more than 60% of DSH-incidents among immigrants were registered in Eastern Norway, and corresponding lower percentages were recorded in another region. This is the case because most people with immigrant backgrounds live concentrated in Eastern, including Oslo and regions around (According to SSB, over 50% of immigrants and people with immigration backgrounds lived in the Oslo region, in 2018 (7)).

DSH-incidents by educational level

In this study, 24% of DSH-cases among immigrants had no or unknown educational level. One important explanation is that only education accomplished in Norway and thus recorded in the database of education were retrieved. Another explanation is that many immigrants had an education in their home country and came to Norway for the purpose of job or family

reunification. But we do not know to what degree the educational attainment from other countries, for instance, in other Nordic and European countries, has been incorporated into the Norwegian education registration system.

DSH-incidents by psychiatric comorbidity

Another important finding was that there were fewer DSH-cases with a pre-existing psychiatric disorder among immigrants. The present results lead to some theories such as the lack of psychiatric history in the Norwegian health system for newcomer immigrants or the difficulty of discovering mental illnesses among immigrants in health care, possibly because of less use of mental health services and a higher threshold to report mental illnesses.

When it comes to specific comorbid psychiatric diagnosis, we observed some interesting findings; personality disorders, alcohol and substance misuse were more frequently among natives. In comparison, depression and other affective disorders were more frequent among immigrants who struggled with DSH.

5.3 Medical Implication

This study provides strong evidence demonstrating that DSHs in immigrants occurred more often among people of younger age, with lower income and education, and with a psychiatric disorder, especially depression and anxiety disorders, relatively to the DSHs by the natives. These findings underscore the need for mental health care among immigrants. It also includes getting immigrants to seek mental help when they need it.

Several studies have shown that people with immigrant background use mental health care poorly as compared to the rest of the population. For example, a Swedish study, in collaboration with the *Norwegian National Center for Suicidal Research and Prevention* (NSSF), has investigated whether the patterns of specialized (inpatient and specialized outpatient) psychiatric and somatic healthcare use, three years before and after a suicide attempt, differ between refugees and the Swedish-born individuals in Sweden. In the study the found that refugees generally used specialized healthcare less than the Swedish-born population, and it was less among those with non-recipient immigrants (36). A Norwegian study has also found that immigrants consumed mental health services less than natives, but non-western immigrants indeed used psychiatric help more frequently than Norwegian-born people (37).

What is not answered explicitly in many of these studies is why is it like that. There have been some suggestions about cultural differences and communication difficulties that make it difficult to achieve an optimal patient-therapist relationship. It also can make it difficult to give an optimal individual customized treatment. Patients' understanding of mental health and illness can also differ based on one's background and culture. A UK study (38) reported significant communicational barriers for immigrants to access mental health care and thus recommended strategies to overcome these barriers as following:

> Increased coordination and communication between voluntary organizations, social services and mental health services; training of staff on cross-cultural issues; integration of mental healthcare with primary care; psychoeducational initiatives focused on families and broader social groups; and technology-based interventions (39)

We are in full agreement with these suggestions and also call for more studies to enhance our understanding of mental health problems, suicide and self-harming behaviours among the immigrant population and to assess the effectiveness of these strategies in Norway as well as in other countries.

6. CONCLUSIONS AND IMPLICATIONS

In conclusion, using the data from several national registers in Norway, this thesis provided insights into deliberate self-harming among immigrants and the native Norwegians. Generally, we have not observed a significantly higher occurrence of DSH among immigrants compared to the natives from 2008 through 2018. The findings here shed new light on the trends defining DSH among younger immigrants with lower income and education levels, which is thought-provoking. Knowing that immigrants from lower-income countries are overrepresented in DSH suggests a possible association between mental health problems and migration. Additionally, the observed high level of depression and anxiety among immigrants with DSH emphasizes the importance of mental healthcare services for this population segment. Hopefully, these findings will help mental health care and other relevant sectors to implement effective preventive measures targeting this growing population segment in Norway.

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