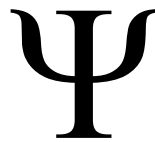




DET PSYKOLOGISKE FAKULTET



Covid-19 pandemic lock-down and mental health of Norwegian children and adolescents from low-income families: results from the New Pattern Study

Main-thesis

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To Hektor,
my biggest inspiration in life.

Abstract

The Corona virus has spread rapidly around the world, and from March 11th, 2020 the World Health Organization declared Covid-19 as a pandemic. Previous research regarding crises and mental health, suggest crises as a risk factor for mental health problems. However, it seems that it is socially and economically vulnerable groups that are most exposed to the negative outcomes. This is evident even in crises that are not fundamentally discriminatory in nature. The current study is based on a group of children and adolescents (n = 164) living with persistently low income, in addition to being considered in longstanding need for welfare services. The participants are part of an innovative project with the aim of investigating whether coordinated and better integrated welfare services can promote their situation. The purpose of this study was to investigate whether it was possible to identify any differences in mental health by comparing responses to the self-report tool Strengths and Difficulties questionnaire (SDQ) collected before the pandemic lock down in Norway, with responses given during or immediately after the lock down in Norway. We also investigated whether there were differences between specific groups within our sample, with regard to immigrant background and gender.

We found no significant differences in responses given during/after the lock down, compared with before, neither at the total score nor at the subscale level. We also found no significant differences in answers among participant with different ethnic background or between gender. Various possible explanations for our results are discussed. However, the pandemic is still raging around the world, and there is an urgent need for more research on the acute as well as long-term mental health consequences of the pandemic, for socially and economically vulnerable groups in society.

Key words: Covid-19, Mental Health, Children and Adolescents, Low Socioeconomic status

Sammendrag

Korona-viruset har spredt seg raskt over hele verden, og 11. mars 2020 erklærte Verdens Helseorganisasjon (WHO) viruset som en pandemi. Forskning på kriser og psykisk helse indikerer at kriser kan regnes som en risikofaktor for psykiske problemer. Imidlertid, ser det ut til at det er sosiale og økonomiske sårbare grupper som er mest utsatt for de u hensiktsmessige konsekvensene. Dette har vist seg gjeldende selv i kriser som i utgangspunktet ikke er diskriminerende av natur.

Denne studien tar utgangspunkt i en gruppe med barn og unge ($n = 164$) som lever med vedvarende lav inntekt, i tillegg til at de vurderes i et langsiktig behov for velferdstjenester. Deltakerne av denne studien er en del av et innovativt prosjekt med mål om å undersøke om koordinerte og bedre integrerte velferdstjenester kan fremme deres livssituasjon. Hensikten med studien var å undersøke hvorvidt det var mulig å identifisere noen forskjeller i psykisk helse assosiert med koronapandemien, ved å sammenligne svar på selvrapporteringsverktøyet Strengths and Difficulties questionnaire (SDQ) samlet inn *før* pandemiens nedstenging i Norge, med svar som ble gitt under eller rett etter nedstengingen i Norge. Vi undersøkte også om det forekom forskjeller mellom spesifikke grupper innad i utvalget vårt, med hensyn til innvandrerbakgrunn og kjønn.

Vi fant ingen signifikante forskjeller i svar som ble gitt under/etter nedstengingen, sammenlignet med før, verken på total skåre eller på subskala-nivå. Vi fant heller ingen signifikante forskjeller blant svar innhentet av deltakere med ulik etnisk bakgrunn eller mellom kjønn. Mulige forklaringer på hvorfor vi får disse resultatene blir diskutert. Imidlertid sprer pandemien seg fortsatt raskt rundt om i verden, og det vurderes å være et presserende behov for mer forskning på de akutte så vel som langsiktige psykiske helsekonsekvensene av pandemien for sårbare grupper i samfunnet.

Nøkkelord: Covid-19, psykisk helse, barn og unge, sosioøkonomisk status

Covid-19 pandemic lock-down and mental health of Norwegian children and adolescents from low-income families: results from the New Pattern Study

Since the first outbreak of the Severe Acute Respiratory Syndrome Corona Virus 2 (SARS-COV-2) in December 2019, the corona disease has spread all over the globe. On March 11th, 2020 the World Health Organization (WHO) declared Covid-19 a pandemic. Absence of an approved vaccine has called to action a number of non-pharmacological interventions (Ferguson et al., 2020), aimed at preventing viral transmission chains of the virus. In Norway this led to closed schools, kinder gardens, and reduced health care for several of weeks, with most people being encouraged to physically distance from each other.

Covid-19 and disease containment measures in Norway

The day after the World Health Organization declared Covid-19 as a pandemic, the authorities of Norway implemented the strictest control measures that have ever been implemented in peacetime, as a response to steadily rising infection numbers. On March 12th, 2020 it was announced that all schools, daycare and universities were closing for 14 days, with possibility for further extension of the closures. Furthermore, all events were canceled, health-care professionals were denied travel abroad, and quarantine regulations were imposed on travelers to Norway. Working from home were strongly encouraged for all workers, especially for workers of occupations defined as non-vital to society (Helsedirektoratet, 2020). To maintain basic needs of population and society, occupations considered as vital functions in society had to continue their work as normal. This includes occupations underlying governance and crisis management, population security and the functionality of society (DSB, 2016).

With schools closing it became necessary for children to receive homeschooling with the support of their parents. However, school stayed open for children with parents having an occupation of vital functions of the society and children in a known vulnerable situation.

A steady reduction in the infection numbers enabled the authorities scheduling a reopening plan for the society. This included schools and daycare reopening at the end of April, starting with kindergartens and 1st to 4th grade, followed by that the rest of the school system who opened May 11th, 2020. Parents were at this time increasingly allowed to return to work, and a number of measures with regard to culture, sports and travel was eased.

The non-pharmacological interventions might have mitigated the number of infections. The impact of the disease containment measures on the society overall, is however of growing concern. The realization that the pandemic will persist for a long time, a different dimension of public health has emerged, and that is the impact on mental health associated with the measures implemented towards viral control.

Preliminary research suggest that children are not considered to be central spreaders of the infection (Isaacs et al., 2020; Li et al., 2020; Ludvigsson, 2020). They are however assumed to suffer major consequences from the national measures, both physically and psychologically, with schools and daycare closing (Brazendale et al., 2017; Brooks et al., 2020; Lee, 2020; Sprang & Silman, 2013). This highlight the need for research on the psychological effect of the ongoing crisis, specifically aimed at children and adolescents, and children and adolescents of particularly vulnerable groups in society (Fegert, Vitiello, Plener, & Clemens, 2020; Lauvrak & Juvet, June 2020).

Crisis and mental health

Studies have shown that largescale disasters (e.g. natural, environmental and traumatic) is associated with an increase in symptoms in depression, anxiety and post-traumatic stress disorder (PTSD) (Dyb et al., 2014; Neria, Nandi, & Galea, 2008; Norris,

Friedman, Watson, Byrne, & et al., 2002). Notably, previous findings regarding measures implemented in respect of previous epidemics such as Severe Acute Respiratory Syndrome (SARS-CoV) and Middle East Respiratory Syndrome (MERS-CoV), suggest that quarantine and social isolation are associated with short-term as well as long-lasting negative psychological effects (Brooks et al., 2020; Mihashi et al., 2009). A study after the SARS epidemic in Canada revealed post-traumatic stress symptoms and symptoms of depression in 28.9% and 31.2% of the respondents, respectively (Hawryluck et al., 2004). Similarly, yet another study after an outbreak of SARS observed psychological disorders in 26.2% of the respondents with the predictive factors of male gender, income reduction, restricted going out and restricted eating (Mihashi et al., 2009).

Brooks et al. (2020) investigated in a literature review what mechanism contributing to the negative psychological effect of quarantine. One of the factors observed was *duration*. Quarantine beyond ten days is associated with higher incidents of PTSD symptoms (Brooks et al., 2020; Hawryluck et al., 2004). It was further identified that fear of infection and inadequate information was found to contribute to the mental health consequences of quarantine, with one of the studies reporting lack of clear guidelines from the government as a predictor of PTSD-symptoms (Brooks et al., 2020; Reynolds et al., 2007). Recent findings regarding the ongoing pandemic indicate a slightly increase in depression in the general population of Argentina, presumably as a result of quarantine (Canet-Juric et al., 2020).

Covid-19 and mental health in children and adolescents

Research in relation to previous crises shows that especially children is prone to experience health-related crises as traumatic, with disease-containment measures characterized by separation, isolation and quarantine (Sprang & Silman, 2013). According to Sprang & Silman (2013), one-third of the children who had an experience with isolation or quarantine in previous epidemics, with this being influenza H1N1 or SARS, showed signs of

symptoms that met the overall threshold for PTSD. Furthermore, comparing PTSD symptoms in children that were quarantined with those who were not quarantined found that the scores of PTSDs was higher in the quarantined children. Notably, the scores of the child participants was higher than the PTSD scores of the parents who were also quarantined (Sprang & Silman, 2013), suggesting that children may be even more prone to the psychological effects associated to quarantine regulations. It seems adequate to assume that quarantine and other disease containment measures is perceived as such an intrusive measure in people's life that the potential mental health consequences are a primary concern in the ongoing pandemic as well.

There is, however, a lack of evidence regarding the psychological impact of the strong measures implemented due to the Covid-19 pandemic. In a literature review Rajkumar (2020) conclude on the basis of the sparse research that are available, that mental health seems to be affected by the Covid-19 pandemics in various groups of people (Rajkumar, 2020). More specifically, preliminary evidence suggest a mental health impact of the Covid-19 pandemic, with an increase in symptoms of depression and anxiety (Ebrahimi, Hoffart, & Johnson, 9. mai 2020; Marques de Miranda, da Silva Athanasio, Sena Oliveira, & Simoes-e-Silva, 2020; Rajkumar, 2020; Zhou et al., 2020)

The restrictions under the pandemic, with emphasis on social distancing may have led to a significant narrowing of social contacts. This is assumed to be experienced as demanding, in respect of the human need for interpersonal contact (Baumeister & Leary, 1995). Social isolation and loneliness is associated with bad mental health outcomes (Leigh-Hunt et al., 2017). In extension of this, research suggest that friendship support play a particularly important role for adolescents well-being, in the form of socialization and closeness (van Harmelen et al., 2017). Efforts have already been made regarding the investigation of loneliness during the corona pandemic lock down and its associations to mental health

outcomes. A Norwegian study found loneliness to be related to depression and anxiety in an adult population (Ebrahimi, Hoffart, & Johnson, 2020). Based on prior knowledge and research regarding humans need for social contact, it is assumed that the strict measures together will have an impact on the mental health of children and adolescents (Fegert et al., 2020). Although little is still known about this specific topic, studies are beginning to reveal the ongoing pandemics consequences.

In China a study was conducted about two weeks after the occurrence of Covid-19, with 584 youth participants completed a series of questionnaires, and revealed that nearly 40,4% of the adolescents was showing signs of mental health problems (Liang et al., 2020). This coincides with findings from a cross-sectional study performed by Zhou et al. (2020), with Chinese adolescents reporting symptoms of depression and anxiety in 43.7% and 37.4% of the cases, respectively (Zhou et al., 2020). Similarly, in Bangladesh a study was conducted with having the parents complete a set of online questionnaires concerning their children's mental health. In this study it was found that up to 43% of the children showed sub-threshold symptoms of mental health disturbances, and the authors concluding with a large portion of children suffering from psychological consequences of the national lock-down (Yeasmin et al., 2020). Yet another study found depression in 11.8% of the cases, and anxiety in 18.9% of the cases (Chen et al., 2020).

Most studies concerning mental health consequences of Covid-19 lock down measures in children and adolescents, is limited to Asian samples. However, a newly published study from Spain have explored the mental health of children and adolescents during the strict disease containment measures the inhabitants lived with for several of months (Ezpeleta, Navarro, de la Osa, Trepal, & Penelo, 2020). This study had a total sample of 226 children and adolescents already being a part of a longitudinal research project. They had the participants and their parents fill out a questionnaire about lock-down experiences, in addition

to the self-report questionnaire SDQ, as a measure of mental health problems. The study revealed an increase in the total score of SDQ, and the subscale of conduct problems, peer problems and prosocial problems compared to answers obtained before the pandemic lock down. They also found a decrease in emotional symptoms, along with no difference for the subscale of hyperactivity and inattention disorder. Furthermore, they explored factors associated with increase in self-reported mental health problems, with this being unhealthy activities, worsening of relationships and a dysfunctional parenting style (Ezpeleta et al., 2020).

Moreover, children with already mental health difficulties have been shown to experience a worsening of symptoms and lack of support from school and healthcare system. This is evident in a study of children previously diagnosed with attention deficit hyperactivity disorder (ADHD) in a Chinese population (Zhang et al., 2020) and a Serbian study of parents of children with autism spectrum disorder (Stankovic et al., 2020).

Based on prior studies, the results suggest that mental health of children and adolescents seem to be affected of the pandemic disease containment measures.

Covid-19 and mental health in Norwegian samples

Most of the published studies concerning mental health consequences of Covid-19 in children and adolescents is carried out in China and countries that are widely different from Norway with regard to way of life, society and economy. It is challenging to interpret whether these observed differences are synonymous with psychosocial consequences experienced by a Norwegian population. To fully understand the mental health impacts of the measures during the pandemic in Norway, there is a need for investigating specifically Norwegian samples. Efforts have already been made to shed light on this topic.

A large-scale study was carried out by Ebrahimi, Hoffart & Johansen (2020) with a Norwegian adult sample consisting of 10 084 people conducting an online survey when the

pandemics restrictions was at its most drastic in Norway. The study found increased levels of psychopathology (Ebrahimi et al., 9. mai 2020). More specifically, compared with non-pandemic benchmark studies, it showed that symptoms of depression were three times higher in the pandemic situation. The anxiety levels were found to be two to three times higher (Ebrahimi et al., 9. mai 2020). Participants of this study were all 18 years of age. Thus, it does not provide accurate information about the psychological effects of the child- and adolescent population.

Bekkhus, Von Soest & Fredriksen (2020) have conducted a study in a Norwegian sample of adolescents. In this study the authors had the participants of pupils in high school conducting an online survey consisting of one open-ended question and some validated screening tools, while most of the Covid-19-restrictions were active. The aim of the study was to investigate whether substituting physical contact with friends, with digital contact was associated with poor mental health and loneliness during the pandemic (Bekkhus, Von Soest, & Fredriksen, 2020). The results suggest that less contact with peers and increased use of social media was related to mental health problems, and the authors concluding with the importance of facilitating physical contact among adolescents, along with reducing social media use, to prevent mental health problems. A limitation of this study represents the lack of data before the onset of Covid-19 lock down to compare with.

Furthermore, a study was conducted by Von Soest et. al. (2020) comparing life-satisfaction and subjective well-being before and after the onset of restrictions due to Covid-19. The participants in this study was middle school students in Norway, more specifically located in Oslo (Von Soest, Bakken, Pedersen, & Sletten, 2020). The authors had teachers present an online survey to pupils in middle school during homeschooling. The results from this study showed a significant decline in life-satisfaction compared with data from previous studies of life-satisfaction in Norway (“Ung i Oslo 2018” and “Ungdata”). Moreover, they

investigated to what extent the adolescent's socioeconomic status was related to life-satisfaction before and after the introduction of disease containment measures, with findings suggesting that the impact of low socioeconomic status on life satisfaction and well-being in adolescents, was less during the pandemic lock down compared with data obtained before the onset of Covid-19.

Most studies (Bekkhus et al., 2020; Chen et al., 2020; Ebrahimi et al., 9. mai 2020; Liang et al., 2020; Yeasmin et al., 2020; Zhou et al., 2020), with some important exceptions being Von Soest et al. (2020) and Ezpeleta et al. (2020), have used a cross-sectional study design. This means that the studies have analyzed data from a population at one specific time. Although this can give valuable information, in example about the present mental health status within a sample, a weakness represents the lack of situation or time to compare with. With several of the previous studies it is uncertain whether Covid-19 with its disease containment measures and societal consequences, is related to the children and adolescents' symptoms of psychological distress. This emphasize the need for further research aimed at investigating the psychological effect of the pandemic, and in this way seek to establish a clearer image of the potential mental health difficulties associated to the crisis.

Furthermore, much of the research carried out in the field of Covid-19 is done with regard to getting out information quickly, as illustrated by many publications being made publicly available as *preprints*, that is publications prior to peer-review. The results must thus in many cases be interpreted with caution; and this further highlights the need for investigate more thoroughly the psychological effect of the pandemic (MITpress, 2020).

Covid-19 and socially and economically vulnerable groups

The corona pandemic has major consequences for the society, in terms of health loss and death, as well as financial outcomes. Harmful effects are due to both the pandemic itself, the loss of health and behavioral changes in the population, along with the comprehensive

infection control measures that the authorities have implemented to reduce the spread of infection (Helsedirektoratet, 2020).

Covid-19 do not discriminate. However, research reveal a tendency of socially and economically vulnerable groups to be more prone to become infected, to develop a more severe sets of symptoms, and to suffer death by the corona disease, compared to non-vulnerable groups (Aldridge et al., 2020; Drefahl et al., 2020; Flodgren & Vestrheim, May 2020; Lauvrak & Juvet, June 2020; Williamson et al., 2020; Wise, 2020). Vulnerable groups of society do also to a higher extent suffer the consequences of the pandemic (Kawachi, 2020; Purtle, 2020), and this pattern is evident in previous disasters and pandemics as well (Bucchianeri, 2010; O'Sullivan & Bourgoïn, 2010; Purtle, 2012). Kawachi (2020) writes "Pandemics disrupts everyone's life, but not in the same way" (p. 1) when he points out the different ways the ongoing pandemic is experienced based on contextual terms like race, gender, social class and immigrant background (Kawachi, 2020).

Preliminary research suggest that mental health is affected in the general population of children and adolescents, associated with the pandemic disease containment measures (Bekkhus et al., 2020; Ebrahimi et al., 9. mai 2020; Ezpeleta et al., 2020; Liang et al., 2020; Marques de Miranda et al., 2020; Von Soest et al., 2020; Yeasmin et al., 2020; Zhou et al., 2020). Research identifies differences in the physical health consequences of the pandemic based on vulnerable versus non-vulnerable groups (Aldridge et al., 2020; Drefahl et al., 2020; Lauvrak & Juvet, June 2020; Williamson et al., 2020). However, less is known regarding how, and to what extent, mental health is affected by crises across specific groups of people.

Socially and economically vulnerable groups

Vulnerable groups of society are in this regard people that suffer the consequences of crises presumably based on race, gender, social class, and immigrant status, and to a higher extent is believed to suffer psychosocial consequences of the ongoing pandemic. Thus,

research showing people belonging some of those specific groups getting poorer health and economy, it is likely that the prevalence have its origin in the contextual term the persons are in (Cooper, 1984; Purtle, 2012).

In addition to the medical consequences of the pandemic, there are also significant psychosocial consequences. These may arise from the pandemic itself and the potential infection. Furthermore, they can have their origins in infection control measures, with strict restrictions on physical social interactions and the restrictions these places on individuals and the services of society. Finally, they arise from the acute and prolonged economic consequences of the crisis. Everyone experiences to a varying degree the consequences of the pandemic. However, some groups are particularly vulnerable and may be exposed to the potential cumulative effect of multiple consequences of the ongoing pandemic (NKVTS, 2020).

Low-socioeconomic status. There is an association between children living in families with low socioeconomic status (SES) and impairments in mental health and well-being (Bøe, Øverland, Lundervold, & Hysing, 2012; McLaughlin, Costello, Leblanc, Sampson, & Kessler, 2012; Reiss, 2013). According to a systematic review by Reiss (2013) children and adolescents living in socioeconomically disadvantaged families was significantly more inclined to develop mental disorders, and higher rates of mental disorders was strongly associated with low socioeconomic status that persisted over time (Reiss, 2013). Growing up in families with lower socioeconomic status children are more vulnerable to develop both externalizing problems, like aggressiveness and hyperactivity, and internalized symptoms like anxiety and depression, compared to children and adolescents who grow up in wealthy families (Dearing, McCartney, & Taylor, 2006; Reiss, 2013; Starfield, Riley, Witt, & Robertson, 2002).

Thus, it is crucial to explore the extent to which low socioeconomic status can be a risk factor also for the development of mental health difficulties in the aftermath of traumatic events like crises.

In a study after the hurricane Ike in Texas it was found that lower education level and low income was associated with symptoms of depression (Tracy, Norris, & Galea, 2011). Similarly, the respondents with the lowest income reported the highest increases in depression symptoms in a study after the 1993 Midwest Floods (Ginexi, Weihs, Simmens, & Hoyt, 2000). In yet another study conducted in the aftermath of hurricane Katrina, nearly half of the respondents of 392 low-income parents exhibited clinical symptoms of PTSD (Rhodes et al., 2010).

Regarding Covid-19, recent findings suggest a socioeconomic disadvantage with respect to higher incidence of infection, severe symptoms and death in adult (Drefahl et al., 2020; Lauvrak & Juvet, June 2020) and child- and adolescent population (Goyal et al., 2020). It remains unclear what causes this association, and more research is needed to investigate the exact mechanisms. However, an assumption represents that, in line with the SES-health link, that low-SES coincides with poorer health (Bucchianeri, 2010). Another factor represents the context of which persons living with low-SES is in. For instance is occupations of low-income associated with being out in the field, and thus more exposed to the risk of infection (Drefahl et al., 2020; Kawachi, 2020; Wise, 2020).

Research that find socioeconomic differences in Covid-19 are alarming, and not unique in the history of contagious diseases (Kawachi, 2020). In a rapid review by the National Health Institute of Norway, they conclude that the knowledge about interventions aimed at socially and economically vulnerable groups with regard to the ongoing pandemic and its consequences, is sparse to absent (Lauvrak & Juvet, June 2020). Moreover, Covid-19 represents more than just a medical diagnosis. In respect to, the extensive outcomes it has on

society, it will be important to examine, whether there are groups that suffer to a greater extent from these consequences.

Attempts have already been made to investigate who is financially affected by crises, and whether groups of people who are affected more severely than others can be identified. A study researching the recessions of the USA from 1970-2011 found a pattern of specific groups being hit harder, with men, blacks, Hispanics, youth, and people with lower education level experiencing increased unemployment and employment declines, compared to woman, workers of prime-age, whites and those with higher education level. This was evident in all the recessions from 1970, with vulnerable groups most likely to lose their jobs during recessions (Hoynes, Miller, & Schaller, 2012). With respect to Covid-19, a study has examined who was hardest hit financially during the first weeks with strict infection control measures in Norway (Bratsberg et al., 2020). Bratsberg et al. (2020) conclude that the corona pandemic affected widely, but not accidentally. More specifically, they identified a social gradient in who was affected financially. Among all employees, it was found that the risk of redundancy or dismissal through the first phase of the crisis was higher the lower education, income, hourly wage and social class background an employee has (Bratsberg et al., 2020). Thus, this applied to a greater extent to women, younger people, low-income families and immigrants. The economic aspect of the pandemic is assumed to be related to emerging or worsening of mental health problems (Kopasker, Montagna, & Bender, 2018).

Research regarding the psychological effect of the corona crisis of children and adolescents of low-socioeconomic status is limited. Income reduction was however found to be one of the predictive factors for psychological impact of the 2003 SARS-epidemic (Mihashi et al., 2009). In line with the research showing low-SES groups to be more prone to the economic consequences of the pandemic (Bratsberg et al., 2020; Kawachi, 2020; Poppe &

Kempson, 2020) it is likely that this group is experiencing heightened psychological stress (Kopasker et al., 2018; Purtle, 2020).

Preliminary findings suggest higher incidents of PTSD-symptoms in youth of parents with low education (Liang et al., 2020; Yeasmin et al., 2020). Associations are also found with regard to parent's chance of losing job, parents education level and parents' income, in symptoms of depression and anxiety in children in Bangladesh (Yeasmin et al., 2020). Furthermore, parents need for attendance in workplace (Yeasmin et al., 2020) and children being home alone on workdays during the pandemic lockdown (Chen et al., 2020) have been found to be related with higher extent of reported symptoms of anxiety and depression.

Moreover, a study aimed at examine adolescents experiences with Covid-19 prosocial acts and its possible connection with mental health, found family financial strain to be associated with higher depressive symptoms and lower feelings of belongingness (Alvis, Douglas, Shook, & Oosterhoff, 2020). In contrast, a study performed by Von Soest et al. (2020) found that children and adolescents of low socioeconomic status, to a lesser extent showed a reduction in life satisfaction during the pandemic, compared with children and adolescents of more affluent homes. This may be related to the fact that children and adolescents of low socioeconomic status loses less with regard to stimulating activities in leisure time (Von Soest et al., 2020). However, further research is needed to establish a clearer image of the situation.

Ethnicity. Past experiences with disasters suggest humans of ethnic race or immigrant background to be a vulnerable group highly affected by its various consequences (Kawachi, 2020). Preliminary results reveal that there is an increased risk of getting infected (de Lusignan et al., 2020) and to suffer death (Aldridge et al., 2020; Drefahl et al., 2020; Williamson et al., 2020) by Covid-19 being an racial and/or ethnic minority. With respect to children and adolescents, a newly published study found higher rates of infection in

participants of racial and/or ethnic minority and participants with socioeconomic disadvantage (Goyal et al., 2020). A Swedish register study has linked all the deaths as a result of Covid-19 to the country's high-quality registry data. A robust finding in this study is an increased mortality among immigrants, even after adjusting for socioeconomic characteristics (Drefahl et al., 2020).

This research suggests that ethnic minorities are more exposed to the physical health consequences of infection, having a more serious course, and more often suffer death as a result of Covid-19. This is in line with previous research regarding epidemics, with the same pattern being evident in the Spanish flu and the influenza H1N1, with American Indians showing an disease-specific mortality rate four times higher compared to other racial/ethnic groups in the American population (Castrodale et al., 2009; Groom et al., 2009; Purtle, 2012).

Taking the comprehensive economic consequences in account, there seems to be a bias in terms of who is affected the most. Studies from Germany, Great Britain and Norway have found that immigrants is more vulnerable to fluctuations in the economy (Bratsberg, Raaum, & Røed, 2010; Dustmann, Glitz, & Vogel, 2010). Moreover, in the USA small business closures due to Covid-19 to a higher extent have hit businesses with black owners, as a big part of them work in the restaurant and retail sector (Kawachi, 2020). This is in line with investigations conducted in Norway, where ethnic minorities increasingly was found to be exposed to dismissal or redundancy in the first phase of the pandemic (Bratsberg et al., 2020).

However, less is known regarding the psychological effect of crises and contagious diseases in ethnic groups. A comprehensive empirical review of studies of mental health effects of disasters before 2002 found participants with immigrant background experiencing more adverse mental health problems in the aftermath of the crises in all of the included studies of the adult population. Of studies including child- and adolescents' samples it was found worse mental health outcomes for participants of ethnic minority in four of six (Norris

et al., 2002). Furthermore, studies in the aftermath of hurricane Katrina found that African Americans showed a higher extent of symptoms of acute stress right after the storm (Mills, Edmondson, & Park, 2007). A year after it was found significantly disparities with regard to ethnicity and symptoms and mental illness (Sastry & VanLandingham, 2009). Thus, previous research suggests that minorities with regard to ethnicity and susceptibility of mental health problems, will be a primary concern in the ongoing pandemic as well.

Purtle (2012) argues the need for underlining that ethnicity in research of health should be observed as social constructs. This is substantiated by the fact that it is little evidence for a biological explanation for the observed differences (Cooper, 1984). Mental health differences in this regard must be considered in terms of contextual terms like income, education and trauma exposures, and factors associated to those (Purtle, 2012).

In the context of the current situation, Purtle (2020) highlights the need for further investigations of the mental health equity in the aftermath of Covid-19 and its various outcomes. Results from a survey conducted in USA during the pandemic found that high psychological distress to a higher extent was reported among respondents of ethnic minorities and respondents with low income (Purtle, 2020). Preliminary research in ethnic minorities and mental health in children and adolescents currently is sparse to absent.

Gender. Gender differences in mental health has been identified and researched for a long time. In children the most prevalent finding is girls showing signs of internalizing mental health problems, which includes symptoms of anxiety and depression, and boys more frequently experiencing externalizing disorders characterized by hyperactivity, conduct problems and aggression (Gutman, Joshi, Parsonage, & Schoon, 2015). Compared to girls, boys to a higher extent show signs of mental health problems. Around adolescence the observed difference do, however, seem to be leveled out, and in later years females are represented with the most observed mental health problems (Gutman et al., 2015).

A register study performed with Swedish mortality data suggest that being male is a risk factor for suffering death by Covid-19 (Drefahl et al., 2020). This corresponds with recent findings from the UK (Williamson et al., 2020). Furthermore, preliminary findings with regard to economic consequences of the pandemic reveal that men was one of the specific groups being hit harder in the first weeks of strict disease containment measures in Norway (Bratsberg et al., 2020). Thus, it may be interesting to investigate more thoroughly whether there exist gender differences in mental health associated to the ongoing pandemic.

An empirical review of previous disasters and its impact on mental health found that in 94% of the included studies, female participants were more affected of mental health problems. This was evident in both adult, and child- an adolescent's samples (Norris et al., 2002). In line with this, several of the reported studies regarding the corona pandemic found that females were more likely to present symptoms of anxiety and depression (Bekkhuis et al., 2020; Chen et al., 2020; Zhou et al., 2020), as well as symptom severity and reduction in life satisfaction was found to be higher among female participants (Bekkhuis et al., 2020; Ebrahimi et al., 9. mai 2020; Von Soest et al., 2020). In contrast the study by Liang et al. (2020) found that male participants scored significantly higher on several of the scales (Liang et al., 2020). This correspond to findings from a study after an outburst of the SARS epidemic in 2003, where male gender were found to be one of the predictive factors of psychological disorder (Mihashi et al., 2009). Knowledge of gender differences regarding the ongoing pandemic thus appears to be compound. This calls for more thorough investigations to better understand and develop interventions adapted to the specific groups.

Vulnerable groups of children and adolescents in Norway

Countries are widely different in terms of way of living, welfare schemes, and economics. This has further impact on which infection control restrictions are introduced, as well as which support schemes are implemented, and to what extent vulnerable groups are

identified and intervened against. To understand how Norwegian children and adolescents of vulnerable groups is affected by the pandemic, there is a need to take research in a Norwegian population to consideration.

Its established in international research that crises, including epidemics and pandemics, affect socially skewed in the population (Bucchianeri, 2010; Dustmann et al., 2010; Hoynes et al., 2012; Kawachi, 2020; O'Sullivan & Bourgoin, 2010; Purtle, 2012). This is evident in the Norwegian population as well, according to a review performed by Hernæs (2020). He concludes with groups of people living with low income being hit the hardest with regard to the previous crises, and the ongoing pandemic consequences. Hernæs (2020) further states the need for follow-up of children and adolescents with a demanding home situation and others suffering from the social distance regime (Hernæs, 2020).

According to new estimates, at least 20% of children and adolescences in Norway are considered vulnerable, and the incidence is expected to increase as a result of the pandemic (Bufdir, 2020a). Many families are able to cope under normal circumstances; however, they are considered vulnerable when frameworks such as school and kindergarten disappear. It has been shown that the pandemic has led to major changes in the services for children and young people in Norway, and that this can have considerable consequences for the children (Utdanningsdirektoratet, 2020). Furthermore, parents with low income and low levels of education have been more exposed to job losses and layoffs (Bratsberg et al., 2020; Poppe & Kempson, 2020), and this will probably exacerbate the challenges of these families.

Low socioeconomic status. Children living with persistently low income in Norway have increased significantly in the last twenty years (Bufdir, 2020a). In 2018 almost 111 000 children was living with persistently low household income (SSB, 2018), with 54% of them having an immigrant background (Furuberg, Grav, Lima, & Munch-Ellingsen, 2018).

Although absolute deprivation, to the extent of lacking food and a place to live, is rare in

Norway (UNICEF, 2012), research shows that also relative deprivation is associated with adverse health consequences (Bøe et al., 2012; Reiss, 2013).

Norwegian children and youth are to a high extent satisfied with their lives (Folkehelseinstituttet, 2018). However, higher satisfaction in school and life in general is found in children and adolescents that lives in affluent homes (Folkehelseinstituttet, 2018). A report prepared by Bakken, Frøyland & Sletten (2016) confirm that children and adolescences with relative few resources, in general have a more problematic relationship to their parents and friends, are less satisfied at school, and more often have physical and/or mental health problems (Bakken, Frøyland, & Sletten, 2016). This is further substantiated by results from the Bergen Child Study that found that the economy of the family significantly predicted mental health problems in the child- and adolescents participants, along with that poor economy was found to be a predictor of higher probability of psychiatric disorder (Bøe et al., 2012).

Despite the fact that several reports acknowledge the challenges vulnerable groups of child- and adolescences face in the corona crisis (Bufdir, 2020a, 2020b; Lauvrak & Juvet, June 2020; NKVTS, 2020; Utdanningsdirektoratet, 2020), few studies have examined Covid-19 and its impact on mental health in vulnerable groups in Norway.

A non-published study prepared by Thoresen, Blix, Birkeland & Andreassen (2020) found that participants with low income reported more concerns regarding Covid-19, along with findings of higher degree of mental health problems, physical pain, loneliness and lower degree of life satisfaction (Thoresen, Blix, Birkeland, & Andreassen, 2020). Moreover, a study conducted in participants with already mental health difficulties involved in treatment in the Norwegian mental health care, found a worsening in mental health problems associated to the corona pandemic (Fosse et al., 2020). This research (Fosse et al., 2020; Thoresen et al., 2020) contain participants from 18-89 years and thus do not examine the Norwegian child-

and adolescents' population. However, the studies contribute to highlight how mental health of vulnerable groups is affected by the disease containment measures implemented in Norway due to the corona pandemic.

A study by Von Soest et al. (2020) have examined life satisfaction in Norwegian children and adolescents of low socioeconomic status before and during Covid-19 lock down. Compared to adolescents in more affluent homes, the group of children and adolescence living with socioeconomic disadvantage showed less reduction in life satisfaction during the pandemic. The difference in measured life satisfaction between respondents with high socioeconomic status and respondents with low socioeconomic status was significantly reduced in the Covid-19 setting (Von Soest et al., 2020). The few and inconsistent findings regarding children and adolescents in this area calls for more research, which is considered crucial in developments of interventions adapted to this specific group in Norway.

Ethnicity. Few of the Norwegian conducted studies address ethnicity and mental health associated to the pandemic, in the child- and adolescents' population. In the study performed by Von Soest et al. (2020) it was found none to small differences in life satisfaction among adolescents with immigrant background compared to respondents with Norwegian background (Von Soest et al., 2020). With respect to previous crises, results from the Utøya massacre found higher rates of PTSD symptoms in ethnic minorities compared to youth with Norwegian background.

Reports prepared by Bufdir (2020a) and NKVTS (2020) elaborates that children with immigrant background are in a particularly vulnerable situation with regard to scarce resources, traumatic experiences they potentially have from the past, as well as language challenges with respect to information about the pandemic (Bufdir, 2020a; NKVTS, 2020).

Statistics show that half of the children and adolescents in the low-income families have immigrant background (Furuberg et al., 2018). Consequently, research taking into

account low socioeconomic status in children and adolescents, to some extent is assumed to illuminate the impact on mental health in ethnic minorities. However, there is a need for more research examining how ethnic minorities in Norway is affected by the ongoing crisis.

Gender. The general research of mental health has found gender differences, in international as well as Norwegian studies (Bakken, 2019; Folkehelseinstituttet, 2018). With regard to mental health impact of Covid-19 and gender, research in Norwegian adult population have so far found that female participants show greater symptom severity of depression and anxiety (Ebrahimi et al., 9. mai 2020). A study by Bekkhus et al. (2020) found that female adolescents to a higher extent reported that they experienced loneliness during the social distance regime in the first phase of disease containment measures, in addition to reporting more symptoms of anxiety and depression compared to male adolescents' participants. The study also found a difference in media-use, with boys to a higher extent spending time on gaming, while girls was reporting more time spent on social media use (Bekkhus et al., 2020). Furthermore, in a study conducted by Von Soest et al. (2020) a decrease in reported life-satisfaction was found to be higher among female respondents compared with data obtained before the Covid-19 restrictions. (Von Soest et al., 2020).

The few studies that have been conducted in Norway aimed at examining the corona pandemic, mental health problems and gender differences, suggest that female adult and adolescent participants to higher extent exhibit symptoms of mental health problems associated to the corona crisis. However, the studies use different constructs to describe mental health problems, making it complicated to interpret the results as a whole. In the context of the divergent international research in gender differences and mental health consequences of the pandemic, questions still remain about whether a specific gender can be seen as a risk factor or possibly a protective factor associated to the outcomes of Covid-19.

Aims

The aim of the current study is to investigate the impact of the Covid-19 pandemic on child and adolescent's mental health in a Norwegian sample of children and adolescents participating in the New Patterns project, with comparing answers gathered on a self-reported questionnaire of mental health before the pandemic lock down and answers obtained during/after the pandemic lock down. Based on findings from prior studies, we hypothesize that there may be a potential worsening in mental health in children and adolescents of low socioeconomic status associated with the corona pandemic.

An aim further represents examining the pandemic lock down possible influence on specific domains of mental health problems. The aim of prior studies has to a high extent centered on measuring depression and anxiety, with one exception being Ezpeleta et al. (2020). Based on the results of this study we hypothesize that we will obtain similar results regarding specific domains of mental health problems, with this being that most of the scores of the subscales obtained during/after Covid-19 lock down being higher compared to scores gathered before lock-down.

We further hypothesize this potential difference in overall mental health, and in specific domains of mental health, is moderated by gender and/or ethnicity. On the basis of results from previous studies we hypothesize that participants of immigrant background have a greater worsening in symptoms of mental health problems compared to participants with Norwegian background. There are conflicting findings in the literature regarding gender differences in mental health problems associated with consequences of epidemics/pandemics. This impedes us forming expectations for possible outcomes in this specific topic.

Methods

Procedure and participants

The current study utilized data from the New Patterns project carried out in Norway. New patterns aim to improve services to families of low-income in Norway who also have

longstanding needs for welfare services (Mølland et al., 2020). The families included in the project receive tailored integrated welfare services through a family coordinator (FC) which aims to support all family members for five years. This includes making a family plan in the start-up of the intervention, which emphasize what is important for each unique family, and which is built on a broad survey of needs conducted at initiation of contact with the families and at annual follow-ups. The surveying of the families includes collecting information about income, education, living conditions, leisure activities, work, health and well-being, and is subsequently repeated in the following years. See Mølland et al., (2020) for a more detailed presentation of the New Patterns project.

The current study samples from participants in the New Patterns project. New Patterns have recruited families on the basis by the following inclusion criteria: that they have children in the age range between 0-17 years, that they have a household income averaged over three years below 60% of the equivalized median income in the population, and that they were considered to be in need of longstanding welfare services. The families were referred to the project by different sectors in the local community. This could be school, kindergarten, child protection services and NAV. They were then discussed anonymously in a multidisciplinary team of members in different services like NAV, child protection services, mental health services and FCs. Inclusion in the project was built on a conclusion in the multidisciplinary team that the families could benefit from the services provided by New Patterns. The team attempted to provide a purposive sample represented by a diversity of the population in target (Mølland et al., 2020). The project has intended to include families that are different in terms of background, type of family and size. An exclusion criterion represented that child protective services was considering taking over the care of the child/children in the recruitment phase. Child protective services involved as a support for the family did, however, not exclude the family of participation. Families that move out of the municipality

or have children that no longer are 17 or younger, leave the project and are not followed-up further.

For the this study the total number of participants was 164 children, as a part of a total of 74 unique families. Mean age of the sample was 10.9 with a standard deviation of 3.1. Percentage of male and female participants was almost equal, with 50.6% being female and 49.4% being male. There was a slight predominance of families with immigrant background in our sample, with 67.6% were, at least, one of the adults was considered with immigrant background. As our sample is consisting of families that are recruited to the project as a whole, some of the children and adolescents that are included in the current study are siblings. Children in each family is ranging from 1-8.

Measurement

Data gathered for this particular study consist of children and adolescents' answers to the self-reported version of Strengths and Difficulties questionnaire (SDQ) at different time points, and for the first, second or third time, depending on how long the child/adolescent have been a part of the project. The first answers were obtained in 2016, and the last answers was gathered during the Covid-19 lock down in 2020. For the present study our data is divided into answers obtained before Covid-19 lock down (LD) and during/after Covid-19 LD, and further analyzed with regard to explore possible differences in the responses gathered before Covid-19 LD and responses gathers during/after Covid-19 LD.

Socioeconomic status

Socioeconomic status of the families was measured by the parent's surveys conducted in the enrollment of the families to the project. The survey included gathering information about education level, work experience, employment status, household income, housing and other relevant expenses, debts, relocations and the suitability of housing (Mølland et al., 2020), all of which provides a thorough survey of the families' financial status. A household

income averaged over three years below 60% of the equivalized median income in the population was an inclusion criterion to enter the project. Thus, all the participants in this study are considered to live in families of low socioeconomic status. Of the included families, 78% is considered to be out of the labor force, and 90% is living in rented housing. Regarding the educational level of the family, about 60% have not completed high school.

Gender

Gender was measured by self-report. Of the total amount of 164 child- and adolescents' participants, there is 81 boys and 83 girls included in this study.

Ethnicity

Ethnicity was measured by self-report in the parent and children/adolescents survey. In this study the family household were considered to have immigrant background when at least one of the adults in the household had immigrant background. Of the households, 50 families were considered with immigrant background, while 24 families in our sample had Norwegian background. In the statistical analysis, household immigrant background was used.

Mental health problems

Mental health in the children and adolescents was measured by the self-reported version of Strengths and Difficulties questionnaire (SDQ) (available from <http://www.sdqinfo.org>) (Goodman, 1997). SDQ is a screening questionnaire considered with a balanced coverage of behaviors, emotions and relationship (Goodman, 1997). The screening questionnaire is designed for use with children and adolescents aged 4-17 years. It comprises 25 items with positive and negative attributes.

The 25 items are divided in five subscales, which are emotional symptoms, conduct problems, hyperactivity-inattention problems, peer-relationship problems and prosocial behavior. Furthermore, the questionnaire is scored on a three-point scale; "not true", "somewhat true" and "certainly true", with the subscale score ranging from 0-10. Data from

SDQ have the potential to give information on the basis of several types of scores. It is possible to have access to subscale scores, a total problem score, and an externalizing and internalizing score. The subscale score is created if there is a response on at least three out of five items, with the use of mean substitution in cases by missing data on items. The SDQ also includes a functional impairment scale as a measure of severity and duration of symptoms, distress, interference with daily activities and burden of the child's symptoms on others.

The SDQ instrument is extensively validated in various countries (Heiervang et al., 2007; Muris, Meesters, & van den Berg, 2003; Smedje, Broman, Hetta, & von Knorring, 1999). Moreover, a review including 48 studies and a total sample of 131,223 participants found the psychometric properties of the SDQ-instrument to be strong, and thus recommended for further use as a screening tool for mental health problems (Stone, Otten, Engels, Vermulst, & Janssens, 2010).

For the current study SDQ is included as a questionnaire that the children and adolescents completed for the first time at the enrollment of the project, and further at each follow-up. This means that the participants that have been a part of the project for a while, completed the questionnaire more than once. In the data used for the current study some participants completed the SDQ-questionnaire up until three times. The children and adolescents completed the questionnaire separately. The answers were scored according to the SPSS syntax provided on the SDQ website referred to above. SDQ total scale, subscale of emotional symptoms, subscale of conduct problems, subscale of hyperactivity and inattention problems and subscale of peer-relationship problems, were included in this study. The current study uses self-reported data only.

Statistical analysis

The statistical analysis was done using IBM SPSS (Statistical Package for the Social Sciences) 25 for Windows Software. Descriptive analysis was reported with the use of means

and standard deviation for age of the children. Furthermore, frequencies were used for total number of participants and families, gender, marital status, residency, education level and immigrant background.

Box plots of the data was generated in SPSS for an descriptive illustration of the main effect of Covid-19 on participants self-reported answers to the total score of SDQ and four of the subscales, with this being scale of emotional symptoms, scale of hyperactivity and inattentional problems, scale of peer problems and scale of conduct problems. Furthermore, box plots were generated as a descriptive illustration of the interaction effects of gender and ethnicity for the total score and respective subscales of SDQ.

Analysis of variance (ANOVA) was conducted to explore the impact of Covid-19 on levels of SDQ total score, scale of emotional symptoms, scale of conduct problems, scale of hyperactivity- and inattentional problems, and scale of peer problems. A univariate general linear model was created by the respective SDQ scales as the dependent variable, and the categorical independent variable of Covid-19 as a fixed factor, with the independent variable of age serving as a covariate.

To examine possible between groups differences of the impact of Covid-19, a univariate general model was conducted with regard to gender and ethnicity, respectively, for all of the included SDQ scales, with the respective SDQ scale as the dependent variable, and the categorical independent variable of Covid-19, along with the categorical independent variables of gender and ethnicity, as fixed factors, in separate analysis.

Age was mean centered, and estimates of effect sizes was obtained, in all of the analysis. We used an alpha level of .05 for all statistical tests.

Ethics

Participation in New Patterns project is voluntary, and the families do not have to be a part of the research project to receive the welfare services included in project. Anonymity and

confidentiality of the participants is protected during data management, in publications and dissemination from the project. Furthermore, the current study is conducted according to recommendations from the Norwegian Data Protection Services.

Results

Demographic characteristics of the sample are shown in Table 1. The total number of child participants was 164, with almost equal numbers of boys and girls, 49.4% and 50.6% respectively. Mean age of the sample was 10.9 with a standard deviation of 3.1. The majority of the children was living with a single parent (59%). There was a total number of 74 families included in the study. Of family descriptive statistics a majority of the parents were single (62%). The most prevalent residency for the families was rented (47.6%) or public rented (44.6%). The majority of the families had immigrant background (67.6%). With regard to parental education level most of the participants in our project reported the highest education level to be primary school (37.8%) and high school (29.7%). Furthermore, several of the participants reported not having completed primary school (21.6%).

Covid-19 Lock Down and symptoms of mental health problems

The mean self-reported symptoms scores for the SDQ total score and each of the specific subscales are portrayed on each of the two categories with regard to answers before LD of Covid-19 and during/after the LD of Covid-19, in Figure 1. The plots give an illustration of equal or slightly higher SDQ score in the answers given during/after the Lock Down of Covid-19.

As shown in Table 2, the two-way analysis of variance did not yield a significant main effect of the impact of Covid-19 lock down on the total score of SDQ. Thus, the self-reported answers on the SDQ total was not significantly lower or higher compared to answers obtained before the Covid-19 lock-down.

From the analysis of each of the included SDQ-subcales, no significant main effect was found of the impact of Covid-19 LD on scale of hyperactivity- and inattentional problems, scale of conduct problems, scale of emotional symptoms and scale of peer problems. Our data do not give indication of Covid-19 LD to significantly influence the answers on each of the subscales of SDQ. Based on these results, our data indicate that the overall mental health problems as measured by SDQ of a population of children- and adolescents living with persistently low-income to a small/not significantly extent have been influenced by the first phase lock down of Covid-19 in Norway. The results are presented in Table 2.

Covid-19 Lock Down and gender differences in symptoms of mental health problems

The mean self-reported symptoms scores for the SDQ total score and each of the specific subscales are portrayed on each of the two categories with regard to answers before LD of Covid-19 and during/after the LD of Covid-19, in Figure 2. The plots are showing that it is small differences in the SDQ scores in answers given during/after the Lock Down of Covid-19, with comparing boys and girls participants.

As shown in Table 3, the analysis of between groups variance conducted to explore the effect of gender and Covid-19 LD on self-reported mental health problems, the main effect of gender was non-significant. Furthermore, the interaction effect of gender and Covid-19 lock down in the SDQ total score was not significant, indicating that a specific gender and Covid-19 together did not significantly impact the self-reported answers on the total score of SDQ.

There was found no significant interaction effects of Covid-19 and gender with regard to the subscales of SDQ. There was, however, found significant main effects of gender on scale of emotional symptoms, scale of conduct problems and scale of hyperactivity- and inattentional problems, respectively. With regard to the subscale of emotional symptoms girls

are reporting a significantly higher extent of emotional symptoms in the answers gathered before ($M = 2.86$, $SE = .235$) and answers gathered during/after ($M = 3.28$, $SE = .322$) LD questionnaire, compared to the answers given before ($M = 2.35$, $SE = .249$) and during/after ($M = 2.38$, $SE = .335$) LD by boys. The significant main effect of gender in subscale of conduct problems goes in the direction of boys reporting higher symptoms before ($M = 1.69$, $SE = .177$) and after ($M = 1.86$, $SE = .238$) compared to reported symptoms before ($M = 1.37$, $SE = .167$) and during/after ($M = 1.36$, $SE = .230$). No significant main effect of gender was found in the subscale of peer problems.

The main effects of gender in subscales (emotional, conduct and hyperactivity) of SDQ indicate gender differences with regard to specific domains of mental health problems in boys and girls, which is not associated with the Covid-19 lock down. The results are presented in Table 3.

Covid-19 Lock Down and ethnic differences in symptoms of mental health problems

The mean self-reported symptoms scores for the SDQ total score and each of the specific subscales are portrayed on each of the two categories with regard to answers before LD of Covid-19 and during/after the LD of Covid-19, in Figure 3. The plots give an illustration of small differences in the SDQ score in the answers given before and during/after the lock down of Covid-19 in Norway, with slightly higher scores obtained by participants with Norwegian background on all of the included SDQ scales.

As shown in Table 4, in the analysis of between groups variance to explore the impact of ethnicity and Covid-19 LD on self-reported mental health problems, there was found no significant interaction effect in the SDQ-total score. There was, however, found a significant main effect of ethnicity, $F(1, 300) = 14.90$, $p = .000$. The group of participants with Norwegian background have significantly higher total mean scores of the SDQ compared to

the group of participants with immigrant background, independent of the Covid-19 lock down.

The interaction of Covid-19 LD and ethnicity on the effect of subscale of emotional symptoms yielded a non-significant result, indicating that the mean change score in questionnaires answered during/after the Covid-19 LD was not significantly different with regard to participants of immigrant background, compared to answers obtained before Covid-19 LD. In the subscale of emotional symptoms there is found a significant main effect of ethnicity, $F(1, 300) = 10.09, p = .002$, which can be interpreted as reported emotional symptoms in the two groups being significantly different, independent of the Covid-19 LD. As illustrated in Figure 3, the participants of Norwegian background are reporting a higher extent of emotional symptoms, both before LD ($M = 3.82, SE = .321$) and during/after LD ($M = 3.22, SE = .487$), compared to participants of immigration background before Covid-19 LD ($M = 2.18, SE = .194$) and during/after Covid-19 LD ($M = 2.75, SE = .250$). This means that the observed difference between groups within our sample is not associated to the pandemic disease containment measures.

For the subscales of conduct problems, $F(1, 300) = 11.57, p = .001$, and hyperactivity- and inattentive problems, $F(1, 300) = 7.0, p = .008$, there was found a significant main effect of ethnicity, indicating that the mean scores of groups of Norwegian- and immigrant background is different. The interaction effect is however non-significant in the subscales. Thus, the significant mean change in reported symptoms of conduct problems and hyperactivity- and inattentive problems, is not associated with the Covid-19 LD.

In the subscale of peer-problems no significant main effect was found for ethnicity. Nor was the interaction effect in the subscale of peer problems, indicating that the mean change score was not significant in the during/after LD reported symptoms of peer problems. The results are presented in Table 4.

Discussion

The aim of this study was to examine to what extent the pandemic lock down was associated to mental health problems of children and adolescents living with persistently low income. In the present study we did not find a worsening in overall mental health problems as measured by SDQ under the pandemic lock down compared to answers obtained before lock down, in a child-and adolescent population living with low socioeconomic status. This was contrary to what we hypothesized. A more detailed analysis of the multiple domains with regard to mental health problems in the SDQ subscales revealed no significant difference of Covid-19 lock down in symptoms of emotional, conduct, hyperactivity- and inattention and peer problems, compared to answers given in the before lock down condition. We identified no significant gender differences regarding symptoms of mental health problems in either the overall total score of SDQ or the subscales of multiple domains of mental health problems, associated with answers obtained during/after the pandemic lock down. Contrary to what we hypothesized, there was found no greater worsening in symptoms of mental health in participants with immigrant background associated to the pandemic lock down. In summary, our sample of child- and adolescents from low income families did not show a worsening in mental health difficulties associated to the Covid-19 lock down.

Similar findings were obtained in a study performed in the Netherlands with adult participants with pre-existing mental health problems, measured with regard to mental health problems before and after Covid-19 lock down (Pan et al., 2020). This study found an increase in symptoms of mental health problems in participants not having a mental health disorder. There was, however, no significant difference in reported symptoms of mental health problems in participants with a pre-existing mental health illness. In participants considered with the highest burden of psychiatric disease it was found a slight decline of symptoms in answers obtained after the Covid-19 lock down in Netherland. Although this study to some extent is similar to ours with regard to measuring a vulnerable group before and

during/after a pandemic lock down, it does contain participants of the adult population, in addition to not addressing socioeconomic background. However, the results coincide to some extent to a Norwegian study taking socioeconomic status in adolescents into account (Von Soest et al., 2020). Compared to measures of life satisfaction prior to the pandemic, socioeconomic resources of adolescent participants were to a lesser degree associated with their life satisfaction during the pandemic lock down. There was found a significant decline in life satisfaction overall. In fact, adolescents living in more affluent families had the highest decline in life satisfaction during the pandemic (Von Soest et al., 2020). Von Soest et al. (2020) argue that young people living with high levels of resources lose more in a lock down than children and adolescents with low socioeconomic status, in example with regard to participation in leisure activities. This is a possible explanation for our results as well. An analysis of social inequalities in one of the Norwegian Ungdata-results identified a social gradient in participation of organized leisure activities in children and adolescents in Norway. In the participants considered with high socioeconomic status, 70 percent stated that they were active in an organized leisure activity. In contrast, 50% of the boys and 40% of the girls in the low-SES group reported the same (Bakken et al., 2016).

Organized leisure activities are associated with better school performances and lower level of stress related to school (Badura et al., 2016). Children and adolescents living with scarce resources, in contrast, use a higher share of their free time at unorganized activities (Bakken et al., 2016), which is associated with deviant behavior and an orientation away from school and education (Mahoney, Stattin, & Lord, 2004). Regarding the first weeks of the phase one pandemic lock down in Norway, there was no offer of organized leisure activities. When these activities shut down for several of weeks, a higher number of children and adolescents with high socioeconomic status had their usual recreative activities withdrawn, compared to children and adolescent living with low socioeconomic status. Likewise, there

were strict restrictions regarding how many outside the family there was allowed to have physical social contact with. Thus, there was a natural limitation of possibilities for participation in unorganized activities. This may have led to a higher share of children and adolescents with a high socioeconomic background during this period having lost the benefits related to engaging in organized activity, at the same time as children and adolescents with low socioeconomic status have been spared the negative effects associated with unorganized activities, during this period of strict infection control measures.

In extension of this, the pandemic lock-down may have let the children and adolescents of our sample of from exposure to situations where the social inequality is visible, like in school and organized activities. In reports prepared by NOVA concerning children and adolescents life conditions in Norway (Sandbæk, 2008; Sandbæk & Pedersen, 2010) it has been shown that most children and adolescents own expensive equipment like mobile phones and equipment needed for skiing, with the authors arguing that this contributes to clear distinction between “those who have and those that have not”. Furthermore, investigations have revealed that children living with low income, to some extent have difficulties with participating in activities with friends, birthday parties and leisure activities that involves expenses, and this is experienced as shameful. Qualitative interviews have found that both children and parents try to hide that they are poor (Sandbæk, 2008; Sandbæk & Pedersen, 2010; Seim & Larsen, 2011). This suggest that the school closure and absence in offer of leisure activities during the strict disease containment measures characterized by the time our participants completed the SDQ-questionnaire during/after Covid-19, may contribute to explaining the absence of observed difference in answers during this time compared to answered obtained before the pandemic, with the children and adolescents to a lesser extent being exposed to those specific situations where the inequality become evident. This can also be seen in the context of research of subjective economic status and mental health problems in

Norwegian adolescents, which has found higher reports of depression and symptoms of ADHD associated to lower perceived economic well-being (Bøe, Dearing, Stormark, & Zachrisson, 2017). Social comparison is probably involved in subjective economic status. During the pandemic lock down, with recommendations of staying home and avoid physical social contact, the subjective economic status may to a lesser extent have affected the adolescent's mental health.

Regarding the extensive economic consequences of the pandemic, with many lay-offs and redundancies to a higher extent affecting groups of low socioeconomic status (Bratsberg et al., 2020) there is reason to expect higher impact of Covid-19 lock down on mental health in socially and economically vulnerable groups (Kopasker et al., 2018; Purtle, 2020). The consequences of parents getting unemployed may affect children and adolescents, via a process of the family getting even poorer, which in turn is assumed to increase level of stress in the parents, and further influence factors associated to the children and adolescent's mental health, in example parenting practices (Bøe et al., 2014). In our sample, however, most of the families consists of adults who are already out of work, with this being 78% of the parents (Mølland et al., 2020). National statistics of children and adolescents living with low income, as well as parent(s) without labor force, was 58.8% in 2017 (Bufdir, 2017). In this context, the high unemployment rates contribute to that our sample is considered a particularly vulnerable group. With our results showing non-significant impact of Covid-19 lock down on mental health of the children and adolescents, the fact that most of the parents were already out of labor force may suggest that the financial consequences to a small extent have affected these families. Thus, there is reason to assume that the current situation to some extent is similar to their normal way of living. They are struggling in several areas in the first place, and a pandemic in addition may not make much of a difference to their situation. The lack of association between Covid-19 lock down and a worsening in mental health in our participants

living with persistently low income, may in this regard be attributed to their possibly unchanged economic situation.

The sample of this particular study represents a group of children and adolescents considered to be a part of a family having an household income, averaged over three years, below 60 percent of the equalized median, along with longstanding need for welfare services (Mølland et al., 2020). Prevalence of mental health problems in socioeconomically disadvantaged children and adolescents is high compared to children and adolescents with more available resources (Reiss, 2013). As expected, is this evident in our sample as well, with the children and adolescents getting relative high scores on the SDQ questionnaire. Studies regarding children and adolescents of low socioeconomic status and possible mental health consequences of the pandemic lock down, is scarce, to absent in international as well as Norwegian research. Our results showing small to absent worsening in symptoms of mental health in answers obtained during/after the Covid-19 lock down, may be viewed as good news on behalf of this vulnerable group. However, we cannot exclude other possible explanations. The sample is measured several times with regard to symptoms of mental health. One explanation of the samples high SDQ-scores and absence of observed difference in level of mental health problems reported during the pandemic lock down, can be a result of *regression toward the mean*-effect; a statistical phenomenon where high scores at one point, tend to move closer to the average scores at subsequent measurements. This phenomena have been shown evident even in absence of an intervention (Streiner, 2001). Thus, our findings may not rule out the possible negative impact of Covid-19 lock down in a group of children and adolescents of low socioeconomic status. Our results rather call for further need of research in this specific area.

The answers from participants we have in the setting during/after the Covid-19 LD is completed up to and including the month of June 2020. This means that the pandemic had

been in Norway for a few months. Our results shed some light on the possible psychological effect of the first phase pandemic LD. Although we did find non-statistically significant differences comparing the two settings of answers obtained, this does not rule out the possible psychological impact of the pandemic and its disease containment measures in the aftermath of this crisis, for socially and economically vulnerable groups of children and adolescents. The pandemic is still an ongoing crisis. As of this writing we are, at best in the middle of the second phase, at worst; at the start of phase two, of the pandemic. In Norway strict disease containment measures with major restrictions regarding physical contact with others, and recommendations of working from home apply again. This entails financial consequences in the form of new dismissals and layoffs, as well as risk of people spending more time alone, all of which in turn may pose a higher risk of developing mental health problems (Ebrahimi et al., 2020; Godinic, 2020).

Research in the aftermath of Hurricane Katrina substantiates that mental health problems, especially for vulnerable groups, may become more evident as time precedes. Although, symptoms of acute stress syndrome was significantly higher in vulnerable groups, like African Americans, just after the storm (Mills et al., 2007), the full extent of the mental health consequences in the aftermath of the hurricane was not apparent before much later (Sastry & VanLandingham, 2009). A study conducted after one year found significant ethnic disparities in symptoms and mental illness (Sastry & VanLandingham, 2009), and even though the symptoms eased with time, a follow-up after 5 years revealed that this disparities persisted, especially in participants with already mental health problems and participants of low socioeconomic status (Paxson, Fussell, Rhodes, & Waters, 2012). These studies include participants of the adult population. However, an empirical review of disaster victims by Norris et al. (2002) found to some extent similar mental health consequences in adolescents participants (Norris et al., 2002). In addition, research in the aftermath of the previous

pandemics have found long-term psychological impact of the disease containment measures in adults (Mihashi et al., 2009) as well as child- and adolescents participants (Brooks et al., 2020; Sprang & Silman, 2013). Our measures are made a relatively short time into the pandemic. Studies of previous disasters, including pandemics, suggest that the risk of mental health consequences in children and adolescents in the general populations as well as in socially and economically vulnerable groups will persist even after the disaster is over. With this in mind, there will be a need for further research of the pandemic's consequences in children and adolescents of vulnerable groups as the pandemic precedes and fades out.

A more detailed analysis of the multiple domains with regard to mental health problems in the SDQ subscales revealed no significant association of Covid-19 lock down in symptoms of emotional, conduct, hyperactivity- and inattentional and peer problems. No differences in answers obtained in during/after Covid-19 LD coincides to some extent with findings from a study using the SDQ questionnaire in child- and adolescents' participants in Spain (Ezpeleta et al., 2020). In line with our results, they found no significant difference with regard to the subscale of hyperactivity and inattentional disorder in answers gathered after the 72 days of lock down in Spain due to Covid-19. However, they identified significant results of symptoms of conduct problems and peer problems, in addition to the subscale of prosocial behavior. As well as their results showed that symptoms of emotional problems significantly decreased after lock-down, compared to answers before lock-down. This study did, however, include a sample of Spanish children and adolescents in the general population, with the majority of the participants being Caucasian (92.9%) and belonging to the high- and mid-socioeconomic level (84.6%), which in this regard have important differences to the sample used in this study. It remains unclear to what extent specific domains of mental health problems is affected due to a pandemic in children- and adolescents living with persistently low income.

We identified no significant gender differences regarding symptoms of mental health problems in either the overall total score of SDQ or the subscales of multiple domains of mental health problems, associated with answers obtained during/after the pandemic lock down. With respect to prior results of research in the area of gender, mental health and pandemics, this appeared compound. In our results answers obtained in girl participants was not significantly different from answers obtained in male participants, associated to the Covid-19 lock-down. In the light of previously conducted studies, this adds to the knowledge that we still don't know whether, or to what extent gender differences in the impact of the pandemic on mental health exists. We did, however, in line with established research, find a significant difference in answers of some of the subscales obtained by female and male participants, not associated to Covid-19 lock down. This being girls reporting emotional symptoms to a higher extent, compared to boys' participants. There were several of the boys reporting symptoms of conduct problems and hyperactivity and inattentional problems, compared to girls. This is all in line with the well-established knowledge of girls showing a higher extent of internalizing mental health problems, while boys more often experiencing symptoms of externalizing mental health problems (Gutman et al., 2015).

Contrary to what we hypothesized, there was found no greater worsening in symptoms of mental health in participants with immigrant background associated to the pandemic lock down. Similar findings were obtained in the study conducted by Von Soest et al. (2020), with none to small differences in life satisfaction in adolescents' participants of immigrant background compared to participants with Norwegian background. Studies of previous disasters and mental health do, however, suggest participants of immigrant background to be more prone to mental health problems associated to the disaster, compared to the general population (Purtle, 2012), and this is evident in adult (Paxson et al., 2012; Sastry &

VanLandingham, 2009) as well as adolescents population internationally (Norris et al., 2002) and nationally (Dyb et al., 2014).

Immigrant background and low-socioeconomic status do, to a high extent, coincide. In Norway, 54% av children living with low income is found to have immigrant background (Furuberg et al., 2018). There is argued that ethnicity in research of health should be observed as social constructs (Cooper, 1984), and that differences in mental health in this regard must be considered in terms of contextual terms like income, education and trauma exposures (Purtle, 2012). In the study conducted by Sastry & VanLandingham (2009) it was found that level of education was the strongest predictor of mental health illness one year after the hurricane Katrina, with those who had completed less than high school, found to be four times more likely to be presenting with mental health illness (Sastry & VanLandingham, 2009). Our sample consists of children and adolescents living in families with adults of low education, where 59.4% having not completed high school, respectively. Although a hurricane disaster has some important differences in relation to a pandemic, there are several similarities considered to be present. For one, hurricanes and pandemics is both natural disasters which humans to a small extent can control. Secondly, there is a chance for mortality and physical illness, along with consequences of primary losses, as an example of housing and assets in regard of a hurricane, and loss of work as a consequence of a pandemic. In this way, taking research in the aftermath of hurricane disaster to consideration, it may possible that mental health problems as a consequence if the ongoing pandemic will become more visible with time, and that especially vulnerable groups of immigrant background and low income will be overrepresented in this regard. However, the lack of pandemic-specific studies makes this discussion deficient. This highlight the importance of close inspection and further research in this area.

Strengths and limitations

The findings from the current study should be viewed in the light of several limitations. The sample used in this study is taking part in a project aimed at making welfare services more coordinated and integrated with the help of a family coordinator (Mølland et al., 2020). In this way the children and adolescents are taking part in an intervention which may improve their mental health, and potentially mask the worsening of mental health problems associated to Covid-19 lock down.

A further limitation represents that the sample is consisting of children and adolescents that have a family relation in the form of being siblings, and this is not accounted for in our analysis. Furthermore, our sample is not equally divided in the two conditions with regard to answers gathered before covid-19 and answers obtained during/after Covid-19 LD. The same children and adolescents' answers have the potential of being represented in both, with respect to that several of the participants have completed the SDQ questionnaire before Covid-19 LD as well as during/after Covid-19 LD. Moreover, some of the participants of the sample have completed the SDQ-questionnaire two or three times. This means that the sample is not considered independent. Children and adolescents have similar genetically and environmental origin, as well as potentially represented in both sample-conditions, some participants have completed the SDQ up to three times. All of this may lead to more similar answers on the SDQ questionnaire.

Although we recognize that, in example, a mixed model regression analysis would be a sophisticated statistical analysis taking into account the variable of time and familial similarities in the current setting, this was considered to be out of the scope of this student thesis. However, our central aim in this regard was to identify possible differences in answers of SDQ associated to Covid-19. A time variable would in addition contribute to measuring the effect of the intervention of the New Pattern project. Investigating this effect was not an aim at this time.

A strength with our study represents that we have answers of SDQ as a measure of mental health problems before the onset of the pandemic, along with answers during/right after the weeks of lock down, which give the opportunity of comparing these to settings of answers obtained. This is considered a strength compared to studies having observation from one specific setting, in example studies of cross-sectional designs.

Furthermore, our sample consists of children and adolescents considered to be a part of a particularly vulnerable group regarding their condition of persistently low-income, having most of the parents out of labor force, along with longstanding need for welfare services (Mølland et al., 2020), which can be a group more difficult to capture and recruit to research projects. Already having a lot of information about the sample, made it possible to include their data in a pandemic relevant study, relatively quick, which is considered important in the matter of this crisis.

Conclusions and further directions

In conclusion, this study found no significant differences in mental health problems measured by SDQ in a sample of children and adolescents from low income families. Nor were differences found between groups within our sample, with regard to ethnicity and gender. Some possible explanations for these results are presented. The situation for our sample may not change significantly compared with before the corona lock down. There is also a possibility for the phenomena of regression towards the mean may help explain the absence of observed difference before Covid-19 lock down and during/after LD in mental health problems. In addition, prior research on crises suggest that mental health problems to some extent emerge in the aftermath of a disaster.

Further research should explore the possible long-term impact of the corona pandemic on children and adolescents living in low income families. Identifying vulnerable groups that to a higher extent may experience inexpedient outcomes of the disease containment measures

is considered important regarding development and implementation of interventions aimed at preventing and treating possible adverse cumulative processes. (O'Sullivan & Bourgoïn, 2010)

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Tables and figures

Table 1

Demographic Characteristics of the Sample

	N (valid%)
Participants	164 (100%)
Gender	
Male	81 (49.4%)
Female	83 (50.6%)
Marital status	
parents	
Single parent	97 (59 %)
Married/cohabitant	67 (40.9%)
Families included	74 (100 %)
Marital status	
parents	
Single	46 (62.2%)
Cohabitant	5 (6.8%)
Married /registered partner	23 (31.1%)
Residence	
Self-owned	6 (8.1%)
Rented	35 (47.3%)
Rented public house	33 (44.6%)

Immigrant background	Non-immigrant	24 (32.4%)
	Immigrant	50 (67.6%)
Level of education parents	Not primary school	16 (21.6%)
	Completed primary school	28 (37.8%)
	Completed high school	22 (29.7%)
	Higher education	8 (10.8%)

Note. Participants (children) were on average 10.9 years old (SD = 3.1).

Table 2

Two-way Analysis of Variance in SDQ Scores Before and During/After Covid-19 LD

SDQ Total Score						
Variables	SS	df	MS	F	p	Partial η^2
Intercept	26643.17	1	26643.17	707.7	.000	.701
Age_C	3.15	1	3.15	.084	.773	.000
Covid	51.12	1	51.12	1.35	.245	.004
SDQ Emotional Symptoms						
Variables	SS	df	MS	F	p	Partial η^2
Intercept	2086.24	1	2086.24	361.72	.000	.545
Age_C	22.32	1	22.32	3.87	.050	.013
Covid	3.93	1	3.93	.681	.410	.002
SDQ Conduct problems						
Variables	SS	df	MS	F	p	Partial η^2
Intercept	664.14	1	664.14	228.37	.000	.431
Age_C	6.03	1	6.03	2.07	.151	.007
Covid	3.92	1	3.92	.135	.741	.000
SDQ Hyperactivity- and inattentional problems						
Variables	SS	df	MS	F	p	Partial η^2
Intercept	4083.09	1	4083.09	609.50	.000	.669
Age_c	3.40	1	3.40	.509	.476	.002

Covid	22.71	1	22.71	3.3	.067	.011
SDQ Peer problems						
Variables	SS	df	MS	F	p	Partial η^2
Intercept	777.39	1	777.39	298.66	.000	.497
Age_C	1.83	1	1.83	.704	.402	.002
Covid	.050	1	.050	.019	.889	.000

Note. Age is mean centered in all of the analysis. SS = Sum of Squares.

MS = Mean of Squares. Partial η^2 = partial eta squared effect size.

Table 3

Two-way Analysis of Variance in SDQ Scores Before and During/After Covid-19 LD with Gender as Fixed Factor

SDQ Total						
Variables	SS	df	MS	F	p	Partial η^2
Intercept	26672.50	1	26672.50	707.5	.000	.702
Covid	48.69	1	48.69	1.29	.257	.004
Gender	16.76	1	16.76	.445	.505	.001
Age_C	7.22	1	7.22	.192	.662	.001
Covid x						
Gender	26.39	1	26.39	.700	.403	.002
SDQ Emotional						
Variables	SS	df	MS	F	p	Partial η^2
Intercept	2048.18	1	2048.18	359.72	.000	.545
Covid	3.58	1	3.58	.629	.428	.002
Gender	33.64	1	33.64	5.90	.016	.019
Age_C	15.62	1	15.62	2.74	.099	.009
Covid x						
Gender	2.68	1	2.68	.471	.493	.002
SDQ Conduct						
Variables	SS	df	MS	F	p	Partial η^2
Intercept	671.74	1	671.74	232.50	.000	.437

Covid	.448	1	.448	.155	.694	.005
Gender	11.41	1	11.41	3.9	.048	.013
Age_C	3.98	1	3.98	1.38	.241	.005
Covid x						
Gender	.547	1	.547	.189	.664	.001

SDQ Hyperactivity

Variables	SS	df	MS	F	p	Partial η^2
Intercept	4125.06	1	4125.06	628.94	.000	.677
Covid	21.97	1	21.97	3.35	.068	.011
Gender	33.16	1	33.16	5.05	.025	.017
Age_C	.657	1	.657	.100	.752	.000
Covid x						
Gender	8.08	1	8.08	1.233	.268	.004

SDQ Peer

Variables	SS	df	MS	F	p	Partial η^2
Intercept	779.28	1	779.28	298.70	.000	.499
Covid	0.74	1	0.74	.028	.867	.000
Gender	.574	1	.574	.220	.639	.000
Age_C	2.37	1	2.37	.911	.341	.003
Covid x						
Gender	1.95	1	1.95	.747	.388	.022

Note. Age is mean centered in all the analysis. SS = Sum of Squares. MS = Mean of Squares.

Partial η^2 = Partial Eta Squared

Table 4

Two-way Analysis of Variance in SDQ Scores Before and During/After Covid-19 LD with Ethnicity as Fixed Factor

SDQ Total						
Variables	SS	df	MS	F	p	Partial η^2
Intercept	22345.33	1	22345.33	633.48	.000	.679
Covid	13.72	1	13.72	.389	.533	.001
EB	525.77	1	525.77	14.90	.000	.047
Age_C	.506	1	.506	.014	.905	.000
Covid x EB	44.00	1	44.00	1.24	.265	.004
SDQ Emotional						
Variables	SS	df	MS	F	p	Partial η^2
Intercept	1783.07	1	1783.07	327.53	.000	.075
Covid	.006	1	.006	.001	.973	.000
EB	54.93	1	54.93	10.09	.002	.033
Age_C	19.51	1	19.51	3.5	.059	.012
Covid x EB	16.81	1	16.81	3.08	.080	.010
SDQ Conduct						
Variables	SS	df	MS	F	p	Partial η^2
Intercept	612.60	1	612.60	218.01	.000	.421
Covid	1.13	1	1.13	.405	.525	.001
EB	32.53	1	32.53	11.57	.001	.037
Age_C	7.65	1	7.65	2.72	.100	.009
Covid x EB	.308	1	.308	.110	.741	.000

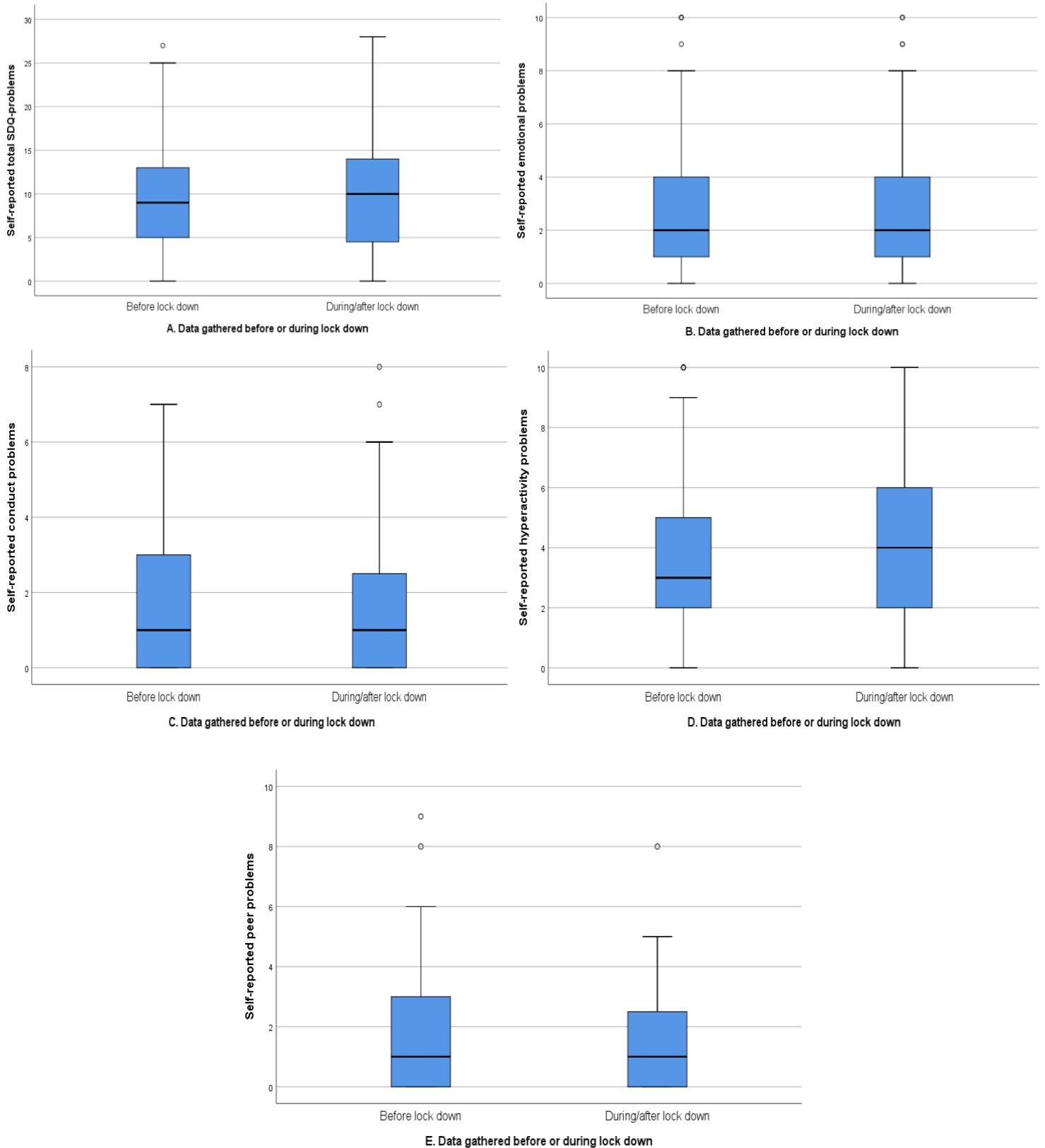
SDQ Hyperactivity						
Variables	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>	Partial η^2
Intercept	3307.56	1	3307.56	504.36	.000	.627
Covid	17.22	1	17.22	2.6	.106	.009
EB	46.16	1	46.16	7.039	.008	.023
Age_C	4.80	1	4.80	.733	.393	.002
Covid x EB	.151	1	.151	.023	.879	.000
SDQ Peer						
Variables	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P</i>	Partial η^2
Intercept	624.74	1	624.74	246.53	.000	.451
Covid	2.05	1	2.05	.811	.369	.003
EB	9.11	1	9.11	3.59	.059	.012
Age_C	1.57	1	1.57	.620	.432	.002
Covid x EB	7.28	1	7.28	2.87	.091	.009

Note. Age is mean centered in all of the analysis. *SS* = Sum of Squares. *MS* = mean of squares.

EB = ethnic background.

Figure 1

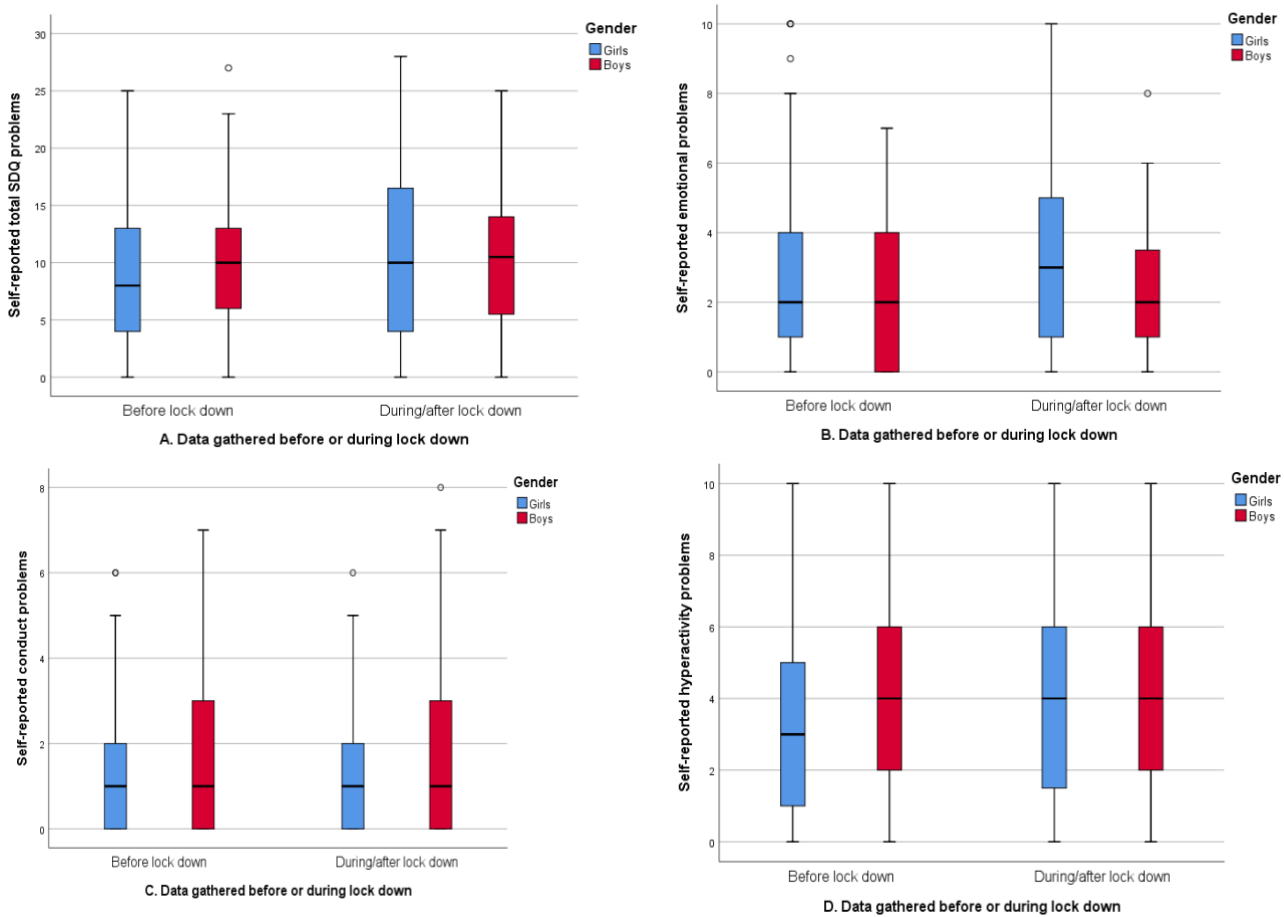
Mean SDQ Symptoms Scores Before Lock Down And During/After Lock Down.

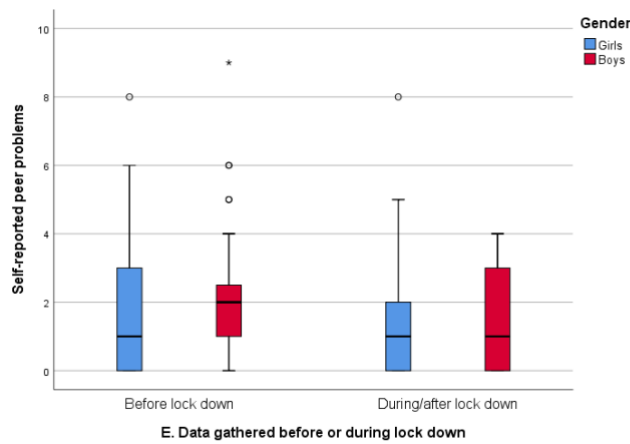


Note. Panel A: SDQ total problems. Panel B: SDQ Emotional problems. Panel C. SDQ Conduct problems. Panel D: SDQ Hyperactivity problems. Panel E: SDQ Peer problems. Range of the Y-axis is different for the figure in Panel A due to a konger range of the SDQ total problems scale. Error bars shows 95% confidence interval.

Figure 2

Mean SDQ Symptom Scores Before Lock Down and During/After Lock Down Sorted by Gender

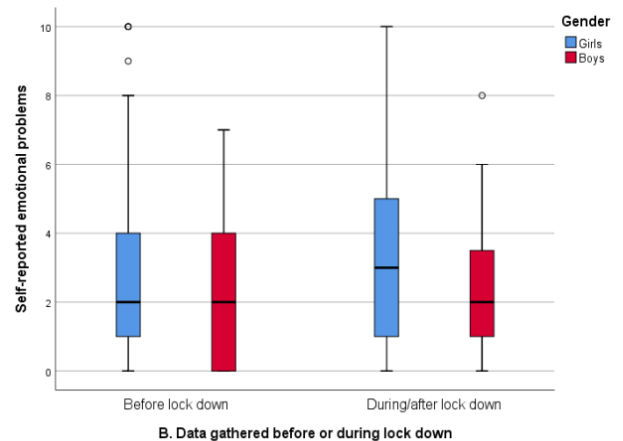
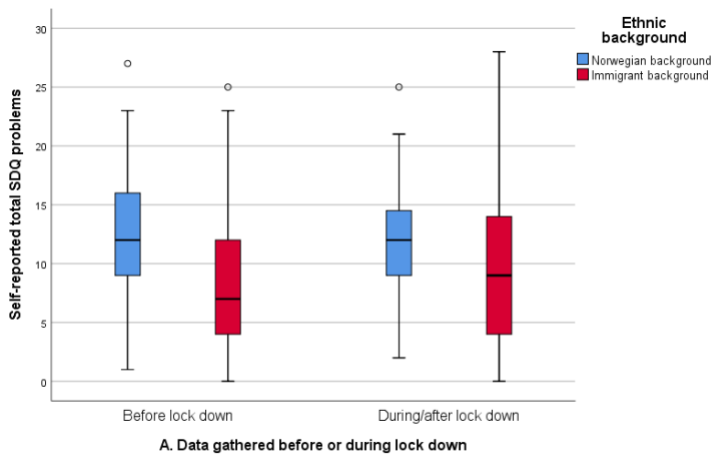


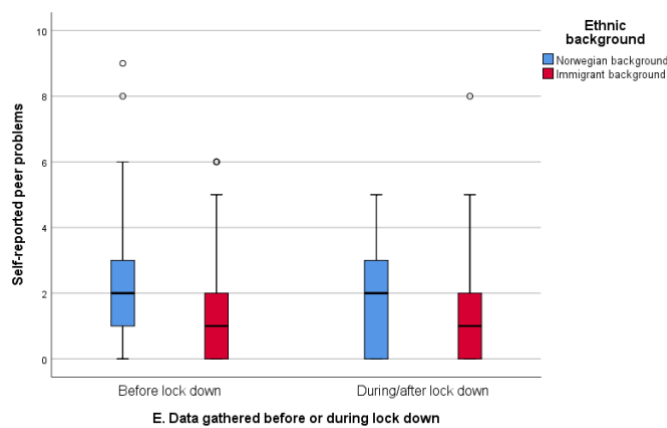
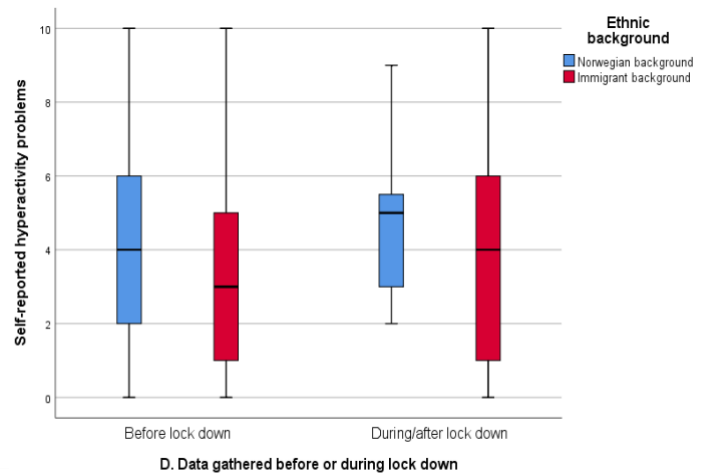
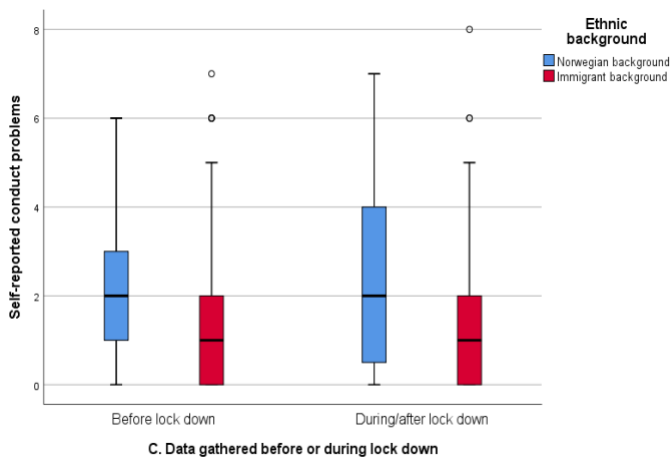


Note. Panel A: SDQ total problems. Panel B: SDQ Emotional problems. Panel C. SDQ Conduct problems. Panel D: SDQ Hyperactivity problems. Panel E: SDQ Peer problems. Range of the Y-axis is different for the figure in Panel A due to a konger range of the SDQ total problems scale. Error bars shows 95% confidence interval.

Figure 3

Mean SDQ Symptoms Scores Before Lock Down and During/After Lock Down Sorted by Ethnicity





Note. Panel A: SDQ total problems. Panel B: SDQ Emotional problems. Panel C. SDQ Conduct problems. Panel D: SDQ Hyperactivity problems. Panel E: SDQ Peer problems. Range of the Y-axis is different for the figure in Panel A due to a konger range of the SDQ total problems scale. Error bars shows 95% confidence interval.

