

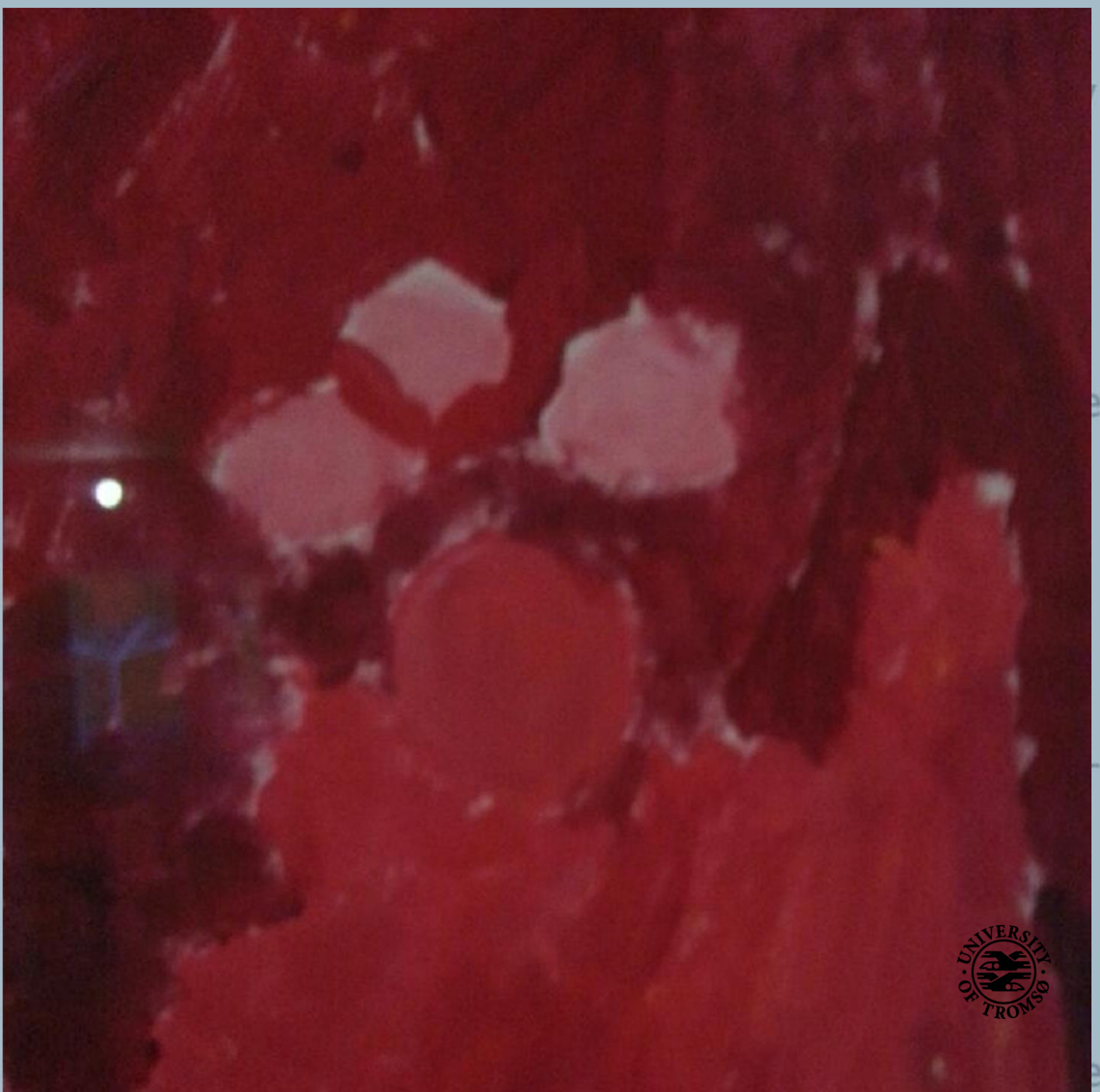
Faculty of Health Sciences
Department of Clinical Medicine

Educational Footprints and Psychosocial Factors in Multicultural Contexts in Arctic Norway

A Cohort and Registry Data Study among Sami and Non-
Sami Students, 2003–2012

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Elisabeth Valmyr Bania

A dissertation for the degree of Philosophiae Doctor – September 2016



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Frontpage: © Anna «Pink Panther`s footprint» (2014)

Introducing conclusion and future perspectives: © Eirik «The Wizard of changes» (2013)

Trondheim, September 2016

Elisabeth Valmyr Bania

LIST OF PAPERS

1. Bania, EV, Eckhoff C & Kvernmo, S (2015). The influence of mental health, psychosocial factors, and educational skills on the educational aspirations of indigenous Sámi and non-indigenous adolescents in the Arctic. *Scandinavian Journal of Child and Adolescent Psychiatry and Psychology*, 3 (3), 169–179.

2. Bania, EV, Lydersen S & Kvernmo S (2016). Non-completion of upper secondary school among female and male young people in an Arctic sociocultural context; The NAAHS study. *BMC Public Health*, 16 (1), 960.

3. Bania, EV & Kvernmo, S (2016). Tertiary education and its association with mental health indicators and educational factors among Arctic young adults: the NAAHS cohort study. *International Journal of Circumpolar Health*, 75: 32086

ACROMYMS

Acromyms frequently in use:

ADHD - Attention Deficit Hyperactivity Disorder

ANOVA – Analysis of variance

CC – complete case

FD-Trygd – the Historical Event Data Base

ISCO-88 – International Standard Classification of Occupation – 1988

MI – multiple imputations

MV – missing values

NAAHS - The Norwegian Arctic Adolescent Health Study

NPR – Norwegian Patient Registry

NUDB – National Education Database

OECD – Organization for Economic Co-operation and Development

OR – Odds Ratio

RWD – reading –and writing difficulties

SDQ – strength and difficulties questionnaire

SES – socio-economic status

KEY CONCEPTS

Educational aspirations were measured by the question, “What is the highest educational level you have planned?” from the cross-sectional survey NAAHS, completed 2003–2005. The students could only respond to one option; recoded into four categories: higher level (1), intermediate level (2), lower level (3), and undecided (4) (undetermined on the choice of profession).

Completion of upper secondary school is defined as achieving a complete upper secondary school diploma within five years after completing lower secondary school, obtained from the National Education Database (NUDB). Not having completed upper secondary school within five years after secondary school was defined as “non-completion”. The terms drop-out and non-completion are used interchangeably, as well as the terms high school and upper secondary school.

Completed tertiary education is defined as “Higher educational level” (University, 5 years and longer) (1); “Intermediate educational level” (University, 3–5 years) (2); “Lower educational level” (Vocational level) (3), and “Not-completed tertiary education” (Other) (4). The data and categories are obtained from NUDB. The four categories are not ordinal, but represent four different levels. Statistics Norway uses the term “no awarded qualification” for not-completed tertiary education. Both terms describe that you don’t have a formal higher education degree.

SUMMARY

The educational process from educational aspirations reported in lower secondary school, the non-completion of upper secondary school and completion of tertiary education among Sami and non-Sami students in Arctic Norway is the topic of this thesis. The main aim was to explore how psychosocial, mental health and educational factors contribute to this process in different sociocultural contexts.

The cross-sectional data from The Norwegian Arctic Adolescent Health Study (NAAHS) was conducted among 10th graders in lower secondary school in Northern Norway; Nordland, Troms and Finnmark county in 2003-2005. Of the total cohort of 5877 lower secondary school students, 4881 responded (RR=83%).

Data from the NAAHS study was merged, with registry data from 3987 adolescents who gave their consent for merging registry data.

The overall findings from the thesis were:

- Male adolescents from Finnmark county have less educational aspirations, more non-completion of upper secondary school and later on, less completed tertiary education
- Males reported more vocational aspirations, and problems coping with everyday life, such as schoolwork, leisure time and life at home, which was associated with more drop-out from upper secondary school
- Females reported more academic aspirations than males, but dropped out of upper-secondary school equally as much as males. Drop-out was associated with more social problems (peer problems and over engaged social behavior)
- There was a higher rate of self-reported emotional problems among females, but they still managed to complete upper secondary school, and also seek low threshold mental help.
- Females who completed lower tertiary education was associated with conduct problems.
- During the educational course, mental health symptoms and disorders were associated with more educational drop-out. Adolescents with lower rates of hyperactivity and inattention problems reported higher aspirations, whereas adolescents with emotional problems showed greater inclination toward intermediate aspirations

- Average mark strongly influenced academic aspirations, but during the educational course both average mark and reading and writing difficulties showed non-significant association as a protective or risk factors, as opposed to other studies
- Sami adolescents showed lower aspirations and marginally higher non-completion rate in upper secondary school, compared to their non-Sami peers

This study suggests that in egalitarian Norway less privileged young adults equally complete education as their better off peers. However, mental health symptoms and disorders along with residency are associated with non-completion of upper secondary school and not completed tertiary education.

Effective mean, such as the legislated 25/5 rule, where age and work experience gives access to education, show in this study how adolescents who drop out of upper secondary school still can manage to complete tertiary education on lower and intermediate level.

Means must be implemented on different levels. On an individual level, knowledge about gender traits, such as masculinity and femininity can help teachers, parents and low threshold health services to support youngsters complete upper secondary school. Means on group level can support young male adults, through low threshold services, building social network and give mental health support. Finally, on macro level, a political debate is relevant to question how our school system is organized.

SAMMENDRAG (SUMMARY IN NORWEGIAN)

Tema for denne avhandlingen er samiske og ikke-samiske ungdommers utdanningsforløp, fra selvrapporterte utdanningsplaner på ungdomsskolen, frafall i videregående skole og gjennomført tertiær utdanning.

Målsettingen var å utforske hvordan psykososiale faktorer, psykisk helse og utdanningsfaktorer påvirket utdanningsplaner og forløp i ulike sosio-kulturelle kontekster.

Tverrsnittundersøkelsen fra Ungdoms helseundersøkelsen i Nord-Norge (UHNN) ble gjennomført blant tiendeklassinger i Nordland, Troms og Finnmark i perioden 2003-2005. Av alle tiendeklassinger (5877 personer) responderte 4881 (svarprosent på 83%).

Data fra UHNN ble koblet med registerdata, og 3987 ungdommer gav samtykke til denne koblingen.

Funnene fra studien er:

- Unge menn fra Finnmark fylke har mindre uttalte utdanningsplaner, større frafall i videregående skole og i har i mindre utstrekning gjennomført høyere utdanning
- Gutter rapporterte mer yrkesfaglige utdanningsplaner enn jenter
- Unge menn rapporterte større problemer med å mestre dagliglivets utfordringer som skolearbeid, fritid og hjemmeforhold, og dette var assosiert med frafall i videregående skole
- Jenter rapporterte mer akademiske utdanningsplaner enn gutter, men droppet ut av videregående skole i like stor grad som guttene
- Frafall i videregående skole blant jenter er assosiert med sosiale problemer, som vanskelige vennerelasjoner og sosial overinvolvering
- De unge kvinnene rapporterte mer emosjonelle vansker (angst, depresjon), og klarte likevel å gjennomføre videregående skole, samt å søke hjelp i førstelinjetjenesten for sine psykiske vansker
- Unge kvinner som gjennomførte lavere grads tertiær utdanning rapporterte større grad av atferdsproblemer
- Gjennom utdanningsforløpet ser vi at psykiske helseplager –og lidelser er assosiert med mer frafall i videregående skole

- Ungdom med fravær av hyperaktivitet/ konsentrasjonsvansker rapporterte høyere utdanningsplaner, mens ungdom med emosjonelle problemer i stor grad rapporterte utdanningsplaner på mellomnivå, typisk bachelor grad
- Gjennomsnittskarakterer var i stor grad assosiert med akademiske utdanningsplaner. Men, gjennom utdanningsløpet viste gjennomsnittskarakter og lese –og skrivevansker seg å ha liten betydning som en beskyttende faktor, og heller ikke som en risikofaktor for ulik grad av gjennomføring. Dette er uventede funn i forhold til mange andre studier
- Samisk ungdom rapporterte yrkesfaglige utdanningsplaner og et noe høyere frafall i videregående skole, sammenlignet med deres ikke samiske jevnaldrende
- Denne studien viste at i det sosialt og økonomisk forholdsvis likestilte Norge kan ungdom gjennomføre ulik grad av utdanning, uavhengig av foreldreøkonomi.

Effektive tiltak, som den lovregulerte 25/5 regelen, hvor alder og realkompetanse (relevant arbeidserfaring) gir utdanningstilgang, viser hvordan ungdom som har droppet ut av videregående skole kan gjennomføre høyere utdanning på lavere grads nivå og mellomnivå.

Tiltak må iverksettes på ulike nivå. På individnivå kan kunnskap om maskuline og feminine særtrekk hjelpe lærere, foreldre og førstelinje/kommunehelsetjeneste med å støtte ungdom i å gjennomføre videregående skole. Grupperelaterte tiltak, som bygging av sosiale nettverk og psykososial støtte særlig bidra med å hjelpe unge menn til å gjennomføre videregående skole. Tilslutt, så må det løftes frem en samfunnsdebatt for å stille spørsmål ved organiseringen av skolesystemet.

ČOAHKKÁIGEASSU (SUMMARY IN SAMI)

Dán dutkosa fáddán lea oahppoproseassa maid sámi ja ii-sámi studeanttat árktalaš Norggas čadahit, namalassii oahppoambišuvnnain maid diedihit nuoraidskuvllas, joatkkaskuvlaoahpu botken ja alitoahpu čađaheapmi. Váldoulbmilin lei guorahallat movt psykososiála, mentálalaš dearvvašvuoda ja ohppui čadnon fáktorat váikkuhit dán prosessii iešguđetlágán sosiokultuvrralaš konteavsttain.

Rastáčuohpahatdáhtaid, iskosis The Norwegian Arctic Adolescent Health Study (NAAHS)/Nuoraid dearvvašvuodaiguorahallan Davvi-Norggas, čohkkejedje 10. luohká ohppiid gaskkas nuoraidskuvllain čuovvovaš Davvi-Norgga fylkkain; Nordlánddas, Romssas ja Finnmárkkus, jagiin 2003-2005. Obbalaš joavkkus, mas ledje 5877 nuoraidskuvlaoahppi, vástidedje 4881 (RR=83%) oahppi.

NAAHS-guorahallama dáhtaid ovtastedje registtardieđuiguin mat bohte 3987 nuoras geat adde lobi ovttastahttit registtardieđuid.

Obbalaš bohtosat dutkosis ledje:

- Nuorra dievdduin Finnmárkku fylkkas leat unnit oahppoambišuvnnat, sii dávjjibut heitet joatkkaskuvllas, ja manjel hárvvibut válbmejít alitoahpu
- Bártnit diedihedje eanet dáhtu háhkat fidnofágalaš oahpu ja váttisvuodaidd birget árgabeaivválaš eallimis, nugo skuvlabargguin, astoáiggis ja ruovttueallimis, mii laktasa dasa ahte dávjjibut heitet joatkkaskuvllas
- Nieiddat diedihedje eanet dáhtu čadahit akademalaš oahpu go bártnit, muhto heite joatkkaskuvllas seamma dávjá go bártnit. Heitin assosierejuvvui eanet sosiála váttisvuodaiguin (válttisvuodát ustitoktavuodain ja badjelmeare sosiála oassálastin)
- Nieiddaid gaskkas lei stuorit mearri iešdiedihuvvon váttisvuodain čadnon dovdduide, muhto sii nagodedje aŋkke válbmet joatkkaskuvlla, ja maiddái ohcat vuosttašceahki psyhkalaš veahki
- Nieiddaid, geat válbmejedje vuolit dási alitoahpu, laktadedje meannoválttisvuodaide
- Oahppogearddis, mentálalaš dearvvašvuoda symptomat ja váttut laktásedje dasa ahte dávjjibut heitet oahpuin. Nuorat, geat hárvvibut diedihedje hyperaaktiivvalašvuoda ja konsentrerenváttuid, vuosihedje eanet dáhtu oahpu

háhkamii, seammás go logut nuorain - geain ledje dovdduide čadnon váttut, čájehedje stuorát soju gaskamearálaš ambišuvnnaid guvlui

- Gaskamearálaš árvosátni garrasit váikkuhii akademalaš dáhttui, muhto oahppogearddis ii čájehan gaskamearálaš árvosátni, eaige lohkan- ja čállinváttisvuodát, mihtilmas assosiašuvnnaid suodjaleaddji- dahje riskafáktorin, mii lea nuppe ládje go eará dutkamiin
- Sámi nuorat čájehedje dáhtu háhkat fidnooahpu ja sis lei marginála alladeappot heaitindássi joatkkaskuvllas, go buohtastahtá ii-sámi nuoraiguin

Dát dutkkus árvala ahte egalitára Norggas nuorra olbmot geain leat heajut eavttut, válbmejit oahpuid seamma dávjá go sin dássásaččat geain lea buoret dilli. Goitge, mentálalaš dearvvašvuoda symptomat ja váttut, ovtta orrunguovlluin, laktadit dasa ahte joatkkaskuvllas heitet ja ahte eai válbme alitoahpu.

Beaktilis doaibmabidju, nugo 25/5 njuolggadus mii lága bokte lea mearriduvvon, mas ahki ja bargovásáhus addá vejolašvuoda beassat oahpuide, čájehit dán dutkamušas ahte nuorat geat heitet joatkkaskuvllas ankke sáhttet nagodit válbmet alitoahpu vuollegeappot dásis dahje gaskadásis.

Doaibmajuid ferte sajustit iešguđetge dásiide. Individuála dásis, dieđut sohkabeliid iešvuodain, nugo maskulinitehta ja feminitehta, sáhttet veahkehit oahpaheddjiid, váhnemiid ja vuosttašceahki dearvvašvuodabálvalusa doarjut nuoraid čadahit joatkkaskuvlla. Gaskaoamit joavkodásis sáhttet doarjut nuorra dievdduid, vuosttašceahki bálvalusaid bokte, hukset sosiála fierpmádagaid ja addit mentála dearvvašvuoda doarjaga. Loahpalaččat, makrodásis, politihkalaš digaštallan lea áigequovdil čielggadit movt min skuvlavuogádat lea organiserejuvvon.

1.INTRODUCTION

The study of an educational course through secondary school and tertiary education explores Arctic adolescents, young adults, their educational aspirations, and the influence of educational factors, mental health and psychosocial factors, and later non-completion of upper secondary school and tertiary education, in a socio-cultural context.

The first topic is educational aspirations, which is examined by cross-sectional analyses, using data from a large cohort, The Norwegian Arctic Adolescent Health study (NAAHS). The second and third topics are non-completion of upper secondary school and completed tertiary education, examined by registry data from the National Education Data Base (NUDB) and the Norwegian Patient Register (NPR).

We wanted to conduct this study, as concerns are raised about our young adults. No doubt education is one of the most important public health issues. Keeping this in mind, we wanted to understand why so many are dropping out of upper secondary school, and why this increasingly great problem is constant in Arctic Norway. The impact on the individual, municipalities, among social groups and in society is enormous. The loss of human capital is large, and the cost for the individual high. We know how education influences employment, financial independence, social inclusion and living standards in general. We wanted to find out what the problem is, and thereby contribute to suggestions and means, to create change so the young adults can use their resources, to empower themselves and contribute in society. By exploring the educational process from lower secondary school to completed tertiary education, via upper secondary school, we wanted to get a broad focus on the trajectory, to be able to understand more, and explain better.

1.1 Rationale

The number of young people dropping out of high school is close to a national epidemic (1, 2). Northern Norway is overrepresented in this picture, compared to other parts of the country (1). Pedersen (3) stated that of the adolescents living in the Nordland County who started high school, 29% had not completed it after five years. This is 11% higher than the average overall drop-out rate in Norway (4) . The numbers are just as high for Troms and Finnmark counties with drop-out rates of 23% and 29%, respectively (4) . The population in the Sami areas in Northern Norway follows the same trend as the rest of Northern Norway. The drop-out rate is higher and education level lower in the Sami areas than other parts of the country (5). Of the

Sami adolescents in Sami areas in Northern Norway who started upper secondary school in 1994, 54% dropped out of high school. Historically, the mainstream school system has represented to the Sami people a forced assimilation into the majority society and culture and a rejection of the Sami culture, which has left many Sami young people and their parents with an ambivalent relationship to the educational system (6). The ambivalence among Sami parents towards school may be transmitted to their children even today, leading to negative attitudes towards schooling among their offspring.

The non-completion rate of upper secondary school increased from 54% in 1994 to 58% in 2002 (5). If one highlights gender differences and areas that receive extra subsidy for primary industry development, the numbers are alarming, where the rate for boys' non-completion rate from upper secondary school in 2002 is as high as 62%–63% (5).

Non-completion of education is associated with more mental health problems, low socio-economic status and, later, work marginalization (3, 7).

Education has a strong impact on living conditions, personal well-being, and health (8-10). Employment which requires formal competence is to a large degree better paid, more interesting, more likely to remain secure in recession times and provides opportunities for professional development and progress (12).

The Norwegian Arctic Adolescent Health Study (NAAHS) was conducted from January 2003 until January 2005. All tenth grade students in all lower secondary schools in the three northernmost Norwegian counties were invited to participate in this study. The participants included 4,881 of 5,877 adolescents who were seniors (tenth grade) in upper secondary school, and they were either 15 or 16 years old. The following response rates (RRs) were observed for the total sample and samples for the three counties: totally 83%, Finnmark 71%, Troms 82% and Nordland 88%, respectively.

In total 3,987 (68%) of the adolescents gave their consent to use registry data. We have linked our sample with the Norwegian Patient Register (NPR) and the National Education Data Base (NUDB).

We wanted to explore these parts of the educational footprint as the relationship between educational aspirations, non-completion of upper secondary school and tertiary education has not been studied previously in an adolescent and young adult population in circumpolar Norway with a particular focus on ethnicity and sociocultural factors.

1.2 Review of research on educational aspirations, drop-out from upper secondary school and completion of tertiary education

1.2.1 Educational aspirations

Adolescents' educational aspirations predict their educational and vocational attainment in adulthood and thereby their opportunities for employment and good living conditions (13). Despite the obvious connection between educational aspirations and subsequent education and employment, many youths have no clear aspirations, or they have not decided with regard to their aspirations. Educational aspirations are strengthened by support from family and friends as well as by other psychosocial factors (14-16), and influenced by good mental health and educational skills (15-19). Complaints that impact daily life and function, are associated with lower educational aspirations (20).

Parents' or caretakers' socioeconomic status (SES) is found to strongly affect children's educational aspirations (21-23), as well as educational achievement (24). Family background predicts educational aspirations with respect to academic self-concept in that highly educated parents can serve as role models for their children (25).

Educational aspirations among adolescents in Arctic Norway are found to differ between and within ethnic groups (26). Kao & Tienda (27) show that historically, minority females tend to have low educational aspirations, but revitalization of indigenous cultures has positively influenced females in this context (5, 28).

Blocked opportunity theory, oppositional identity, and status attainment are key concepts for understanding the educational aspirations of minority youths (27). The term *blocked opportunity* refers to a lack of social mobility and a self-fulfilling prophecy of maintaining one's social class and SES (27). *Oppositional identity* is understood as a minority group's rejection of a majority group's rational choices, based on the minority group's values and beliefs (29, 30), or perception of their educational outcomes as blocked opportunities if they maintain their traditional ethnic and religious values. *Status attainment* results from social mobility, which is facilitated by improved living conditions and student loan and scholarship for all students (31, 32).

1.2.2 Non-completion of upper secondary school

Non-completion of upper secondary school is a widespread phenomenon and a public health issue, as education has a strong impact on living conditions, personal well-being, and health (33). Based on current research, it is estimated that an average of 17 per cent of all young

people, mainly males, within the Organization for Economic Co-operation and Development (OECD) countries will not complete upper secondary school over their lifetimes (34, 35). Young women are now more likely than young men to complete upper secondary school in almost all OECD countries (34, 35).

Mental health issues and behaviours representing a risk to health are found to influence performance in upper secondary school (36) and completion (37). Youngsters diagnosed with ADHD (Attention Deficit Hyperactivity Disorder) are more likely not to complete upper secondary school due to attention problems and comorbid learning disabilities (17). Externalizing symptoms such as hyperactivity symptoms and conduct problems are associated with higher drop-out from upper-secondary school (17, 19) as well as tertiary education (38).

Breslau et al. (17) suggested that internalizing symptoms such as depression do not influence youngsters' completion of upper secondary school, while other studies show a significant association between early adolescents' depressive symptoms and later non-completion of upper secondary school (37, 39). In studies of younger adolescents, deviant behaviour such as poor conduct is a contributing factor to non-completion of upper secondary school by obstructing educational achievements (39-41).

Putnam (13) stated that among all of the predictive factors associated with children's well-being, psycho-social factors, second only to poverty, have the greatest influence on children's development and attainment of future outcomes. Garg et al. (25) suggested that family background predicts educational aspirations with respect to academic self-concept, as highly educated parents can serve as role models for their children.

Schifloe (42) presents that a strong social network strengthens resilience, reduces suffering and symptoms of mental impairment, and Coleman (14) states that social relations are particularly vital in "closed networks"(43). Lauglo (43) states that the potential for socialization and normative regulation of behaviour is strongest in closed networks, as social sanctions will have greatest effect. Coleman (14) emphasises that social capital through these closed social networks is seen in religiously based private schools, as the social regulation is more extensive among adults than in other private non-religiously funded schools, underpinned by a joint togetherness ("Geimenschaft") between students, parents and school.

Newcomb, Abbott (44) found that structural factors such as gender, ethnicity and socio-economic status (SES) along with academic achievement, reflected in marks, influenced completion of upper secondary school. Average mark is the single most prominent finding

from several studies of completion of upper-secondary school (44), which is also shown to have great impact on completion of tertiary education (44).

The SES of parents or caretakers is found to strongly affect educational aspirations (21-23). Parental SES is shown to have great impact on completion and non-completion of upper secondary school, where low parental SES is associated with non-completion, and higher parental SES associated with completion of upper secondary school (45, 46). Tertiary education among young adults is also found to be strongly associated with parental educational level, income and work status (47), strengthened by parental support and involvement (48).

Educational skills, parental SES, the social context and mental health all influence educational aspirations (20), underscoring the importance of adolescents' motivation to complete upper secondary school (18, 21, 23, 45) and may act as mediators or predictors of both completion and non-completion of tertiary education (49).

Previous studies have revealed that indigenous peoples have higher non-completion rates than the majority population (50-52), where Kao & Tiendas (27) identify blocked opportunity, oppositional identity and status attainment, and explain this by minority adolescents' experience of lacking access to social mobility, or a rejection of rational choices and a self-claimed masculine "coolness" towards school (53).

Parental socioeconomic status (SES) is shown to have a great impact on educational aspirations and educational attainment in several studies (25, 45, 46), while studies in Arctic Norway have shown that parental SES has limited or no effect on educational aspirations or completion of upper secondary school, regardless of ethnicity or gender (20), and increasingly greater effect in tertiary education (54). School drop-outs are more likely to be engaged in anti-social and criminal behaviour (55). Moreover, these patterns tend to reproduce themselves in the family, making it harder for children of parents with lower educational levels to move upwards in socio-economic status (11).

Rural students and their educational performance are an important topic in educational research worldwide (56-59). The term *opportunity structure*, developed by Cloward and Ohlin (60), is a key concept in understanding that different contexts constitute different opportunity structures. Examples of such opportunities, or lack of such, are geographical closeness to educational institutions and range of study programmes, as well as access to labour markets. Knowledge of the local opportunity structure must be known and acknowledged by individuals to be able to understand and explain empirical findings in a specific context (56).

Green and Corbett (57) found that place of residency is important in educational attainment and influences completion and non-completion of upper secondary school, where remoteness can contribute towards a lower completion rate.

1.2.3 Completion of tertiary education

Tertiary education has expanded markedly in western countries over the last decades, and in 2012, tertiary qualification was achieved by every third adult in OECD countries (35). Female tertiary education has increased internationally according to OECD reports (35). In 2000, adult men had higher tertiary attainment rates than adult women. In 2012, however, the situation was inverted: 34% of women had attained a tertiary education compared with 31% of men (35).

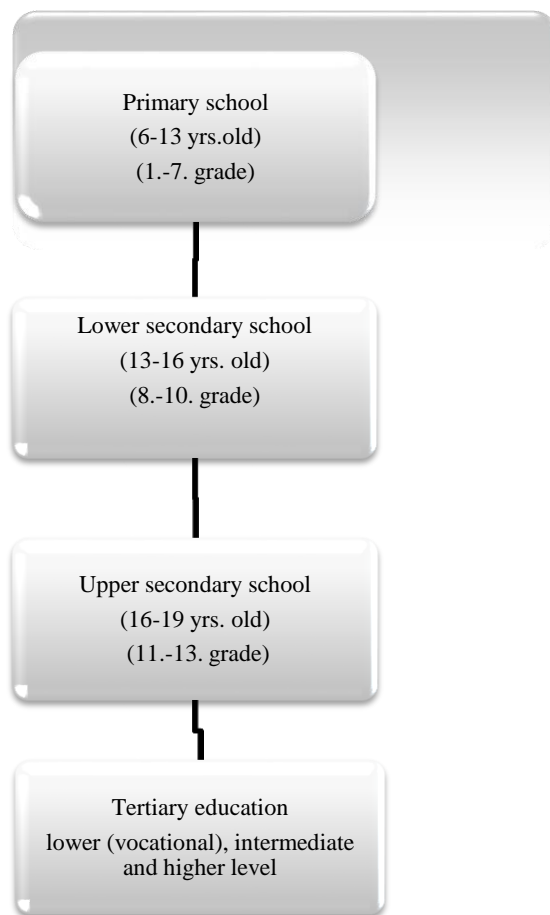
Employment status and income are associated with level of education (12). There is a clear association between dropping out of upper secondary school, and employment and income, compared to persons with tertiary education (61). For every year of schooling a person completes, earnings rise by approximately 10 per cent (10). More highly educated individuals also receive less unemployment benefits, less social welfare benefits and are less likely to receive disability pension, than people without tertiary education (8, 9, 11).

1.3 The educational system in Norway

Norway has about 5 million inhabitants, with more than 400 municipalities and 19 counties. More than half of the municipalities consist of less than 5000 inhabitants.

There are three administrative levels in Norwegian education; each municipality is responsible for primary and lower secondary school (1-10th grade); each county is responsible for the upper-secondary school (11-13th grade and trainee opportunities within vocational programs and follow-up among youngsters who drop out of upper secondary school). Finally, tertiary education is taken care of by national authorities (lower, vocational degree, intermediate and higher university level). There are a few exceptions within the educational system, where the institution is privately driven.

Fig 1 The educational system in Norway



1.4 The multicultural Arctic Norway

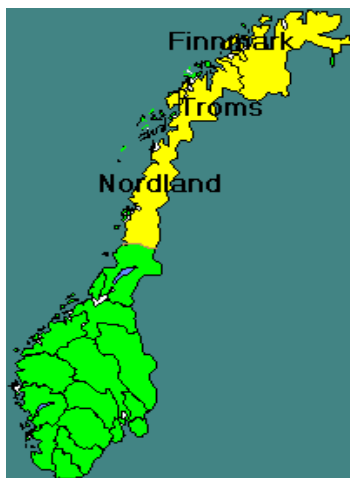
The Arctic region in Norway is inhabited by indigenous and non-indigenous people. The Sami are the indigenous people residing in the Arctic region of northern Scandinavia and Russia. The highest density of Sami can be found in sparsely populated and remote Finnmark County, the core area for Sami, where they are in a majority in several communities. About one third of the Sami population live in this county. The density of Sami gradually decreases with the distance from this core region. In this study, about twenty per cent among the minority Sami reported Laestadian affiliation, which is about four times more than among majority Norwegians. Laestadianism, which has been a substantial religious movement since the early 1800s, was initially strong among the Sami in Norway, Sweden and Finland. Laestadianism is traditionally considered a Sami version of Lutheran Christianity, holding a strong religious and social position with its abstinence norms (62-64). The Laestadians still represent an essential social and cultural network in the Arctic area.

The so-called Norwegianization period may have influenced the family system's view of higher education, with negative experiences connected to the school systems and forced language shifts. However, in recent decades, a strong revitalization of the Sami culture and a higher living standard have emerged among the Sami, decreasing the social gap between the majority and minority population and increasing their level of cultural pride (65, 66).

1.5 Ethno-cultural context

Arctic Norway, and particularly Finnmark County, represents a periphery and is sparsely populated. The ethnographical context of Arctic Norway constitutes a unique structural frame, compared to more centralized locations, with its indigenous Sami, the Lutheran Christian Laestadians and the geographical periphery. Several of the municipalities in Arctic Norway have the most disadvantaged living conditions in Norway (3, 67). Statistics Norway (4) states that of all the municipalities with living condition problems, two thirds are located in Northern Norway.

Fig. 2 Norway, geographical study area in yellow



1.6 Socioeconomic factors

Socioeconomic status (SES) is a combined measure of an individual or family position or relation to others concerning work position, education and economy, and is often measured by parental finances, parental education and occupation.

Norway is a tax-funded, redistributive welfare state, with universal entitlements and generous contributions for social and financial security, shown to protect against crime and social injustice (31, 32). Tuition-free higher education and student loans contribute to social mobility and social equality. The reverse of this picture can be that young adults choose

welfare benefits over employment and work-based income (7, 9). Work is a source to social inclusion, and it affects health and well-being (33, 68).

1.7 Psychosocial factors

Adolescence may be a stressful period and several psychosocial difficulties are associated with adolescent educational factors. Social support and positive relationships are important supportive factors in the classroom, with fellow peers and teachers, and elsewhere (11).

Educational attainment is found to be associated with peer problems (20). Parental support is important for the adolescents and influences their educational attainment (16, 21).

Stress and pressure are known to act as psychosocial risk factors of mental health problems (69).

1.8 Mental health factors

The debut of most mental health disorders is during the 12–24 year age range (70).

Adolescence and young adulthood is the time when most people establish social relationships, academic careers and enter the job market. Mental health problems and possible disorders can potentially influence all these matters negatively (70).

Previous studies in youth have shown a complex relationship between educational aspirations and achievement and mental health problems, and this complex relationship was found in both cross-sectional (17) and in longitudinal studies (16, 19).

1.9 Educational factors

Educational characteristics, such as educational aspirations, average marks and reading and writing difficulties are found to mutually influence each other (20, 71). Academic performance is one of the most important and stable predictors for drop-out (72, 73). Reading difficulties do not indicate solely learning difficulties, but a lack of comprehension can impact average marks and completion or non-completion of upper secondary school (74). Writing difficulties are often combined with reading comprehension difficulties, indicating complex difficulties and leading to poor marks and non-completion (71, 74). Reading and writing difficulties are characterized by visual, temporal and phonological processing and lower processing speed, in addition to poorer metacognitive awareness and memory (75). These factors are increasingly important in tertiary education, with more material to read and understand, as well as assignments and exams with time limits.

1.10 Theoretical framework

The theoretical framework in this thesis comes from Kao & Tienda (27), who operationalize minority youth and educational aspirations by the terms: blocked opportunities, oppositional identity and, status attainment framework. Blocked opportunity refers to lack of social mobility, and a self-fulfilling prophecy of maintenance of social class and socioeconomic status, and thereby fewer opportunities (27). Oppositional identity can be understood as the minority group rejecting majority groups' rational choices, based on their values and beliefs (29, 30), which can be the fact among indigenous Sami and people with Laestadian affiliation (76). Status attainment is a result of social mobility, which is made possible by factors such as national student loans for living expenses and tuition-free higher education, which is the case in Norway (31).

Academic achievement, general deviance, deviant affiliation, family socialization and structural factors are key concepts based on central theoretical approaches related to high school drop-out (40). In this theoretical model of drop-out, academic achievement, in terms of average mark, is a factor mediating the effects of other variables in predicting early school drop-out (37, 77). Deviant behaviour, such as delinquency and drug use, is associated with drop-out as well as low academic orientation (17, 19). Early sexual activity and teenage pregnancy is a constant predictor of high-school drop-out (33). Deviant affiliation, behaviour and development is widely accepted by peers (78). Research has concluded how drop-outs have more deviant friends, and these social factors can affect academic achievement and a decision to leave school. Family is the most important socialization institution in a developing child's life, where the foundation for life and academic achievement is found (40). Dropping out of school is a process of disengagement that begins early (44, 77). Factors like parent divorce, family stress, and parental behavioural control and acceptance are influential (79). The most important factor for a child's academic success has been the parents' own educational levels (11). Structural factors such as socio-economic factors are associated with non-completion of upper secondary school (44). Child poverty is rampant in the U.S., with more than 20 per cent of school-age children living in poor families (80). Poverty rates for minority Black and Hispanic families are three times the rates for White families. In 2009, poor (bottom 20 per cent of all family incomes) students were five times more likely to drop out of high school than high-income (top 20 per cent of all family incomes) students (81).

Cloward and Ohlin (60) contribute with the key concept *opportunity structure* in understanding that different geographical contexts constitute different opportunities in

education. Examples of such opportunities, or lack of such, are geographical closeness to educational institutions and range of study programmes, as well as access to labour markets. Knowledge of the local opportunity structure must be known and acknowledged by individuals to be able to understand and explain empirical findings in a specific context. The term is essential in the thesis, as ethno-culture and periphery are central factors.

2. AIMS OF THE STUDY

Our overall aims in this study were to explore and explain how educational aspirations and educational completion differ in a multi-ethnic Arctic population of Sami and non-Sami adolescents, and the influence of religious and ethnic group membership, educational factors, psychosocial and mental health factors.

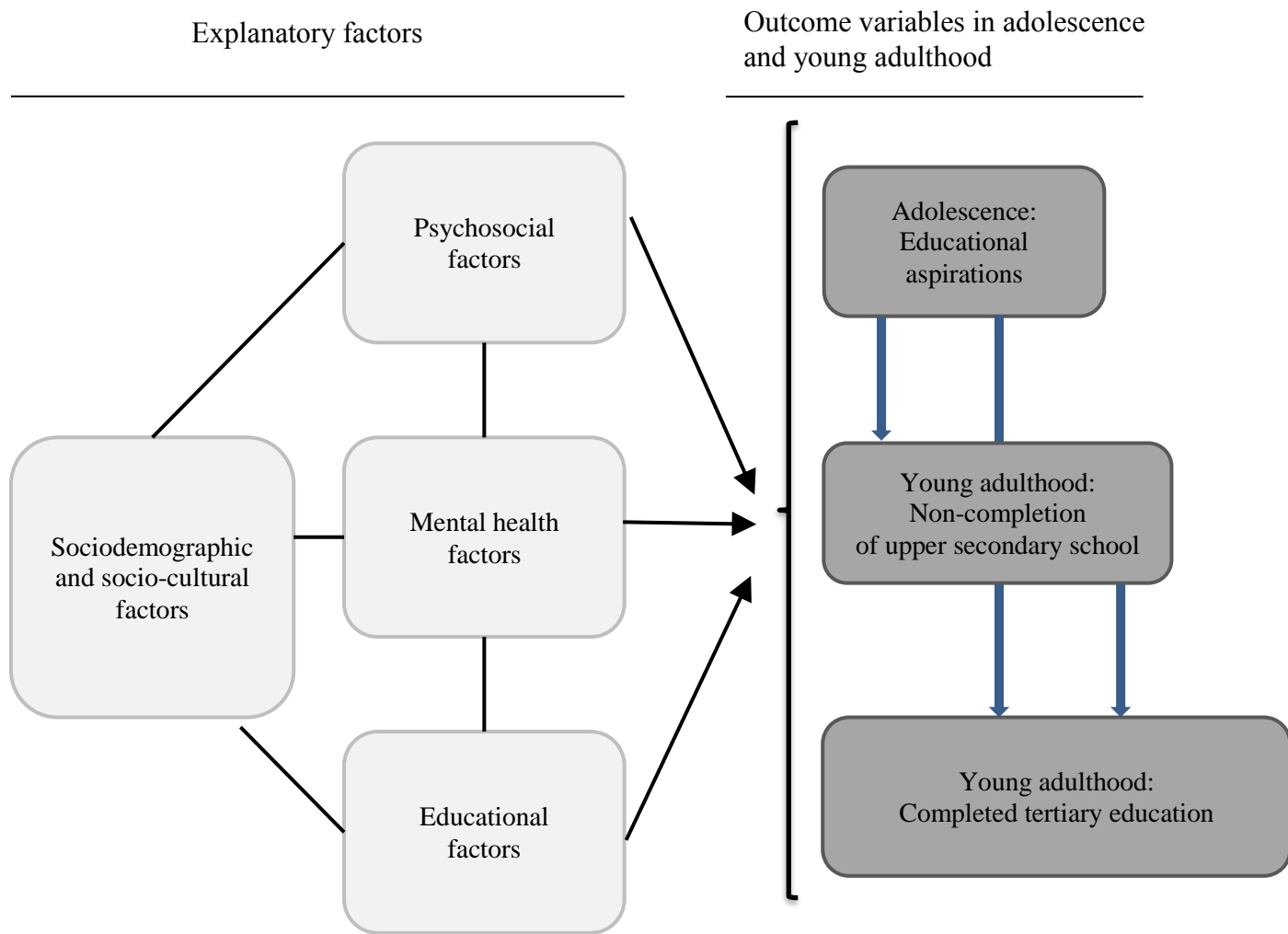
First, we explored the adolescents' educational aspirations in their last year of lower secondary school, relating the aspirations to psychosocial health, mental health factors and educational factors in a socio-cultural context.

Then, to follow the adolescents into their late teens to estimate the prevalence of non-completion of upper secondary school, and to determine the predictive value of adolescent sociocultural factors such as residency, parental socioeconomic status, ethnicity, and Laestadian religious affiliation on completion of upper secondary school. Thereafter, we wanted to examine the impact of personal traits such as young people's mental health (symptoms and functional impairment), and educational characteristics on later non-completion of upper secondary school. And finally to examine possible gender differences as predictors of completion and non-completion of upper secondary school.

Further on, we followed the young adults into their early twenties to explore accomplished tertiary education on university level as well as certificated vocational level, and also determine the importance of predictors, such as gender, ethnicity, residency, religious affiliation, mental health, and educational issues.

Our final and most ambitious aim was to explore associations of the educational footprint from educational aspirations in lower secondary school to completed tertiary education, via upper secondary school; and find patterns and thereby means for changing the negative educational course among females and males in Arctic Norway.

Fig 3 Study design and relationships



3. METHODS

3.1 Sample and procedure

The Norwegian Arctic Adolescent Health Study (NAAHS) was conducted from January 2003 until January 2005. All tenth grade students in all lower secondary schools in the three northernmost Norwegian counties were invited to participate in this study. The participants included 4,881 of 5,877 adolescents who were seniors (tenth grade) in lower secondary school, and they were either 15 or 16 years old. The following response rates (RRs) were observed for the total sample and samples for the three counties: total, 83%, Finnmark, 71%, Troms, 82% and Nordland, 88%.

The psychosocial and mental health factors in the NAAHS study included more commonly used and validated scales, such as the SDQ-scales (82), and measures less frequently used outside of the Youth Studies (The Norwegian Institute of Public Health. **Youth Studies** [<http://www.fhi.no/artikler/?id=105586>]). The use of validated instruments reduces the chance of measurement error by increasing the validity and objectivity of the measure. The less frequently used psychosocial measures make it harder to replicate the findings. Another weakness of these measures is the lack of a timeframe for the psychosocial measures, with the exception of the SDQ-scales. Still, most scales had sufficient internal consistency.

The questionnaires were administered during a two-hour period in a classroom setting monitored by project staff, and non-attending students completed them later. The questionnaire was available in both the Sámi and Norwegian languages.

The adolescents had to provide written consent for later follow-up studies including linkage to registry data. In total 3,987 (68%) of the adolescents gave their consent to registry data follow-up. We linked responses from the group who gave their consent from NAAHS with the Norwegian Patient Register (NPR), which provides information about each person's contact with specialist health care system, in- and outpatient together.

We also linked NAAHS with the National Education Data Base (NUDB), which provides information about completion of upper secondary school and different level of completed tertiary education. The NUDB linkage allowed us to follow each person's educational progress up to the age of 25.

The NUDB and NPR are high quality national education and patient registries.

The Norwegian Data Inspectorate and the school authorities approved the NAAHS study. The Regional Committee for Medical and Health Research Ethics approved the

NAAHS and the registry linkage, ref. 18/2003 and 2012/1381. The Norwegian Institute of Public Health and Statistics Norway carried out the registry linkage.

Data from the NUDB and NPR are used in this thesis. The interpretation and reporting of these data are the sole responsibility of the authors, and no endorsement by the NUDB or NPR is intended, nor should it be inferred.

Fig 4 Study timeline

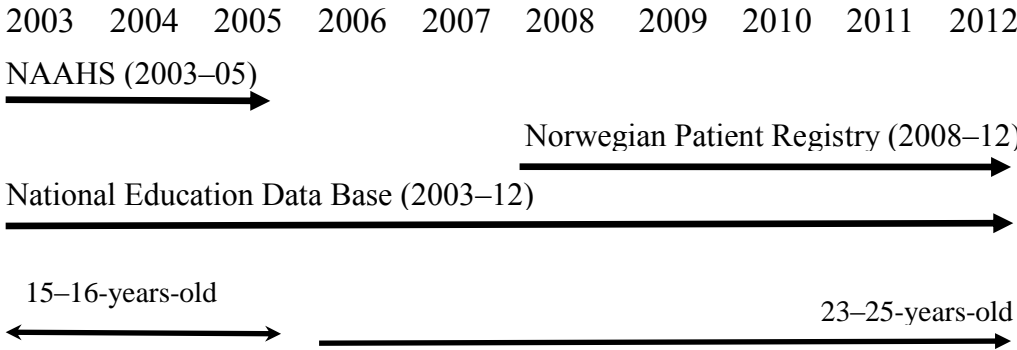
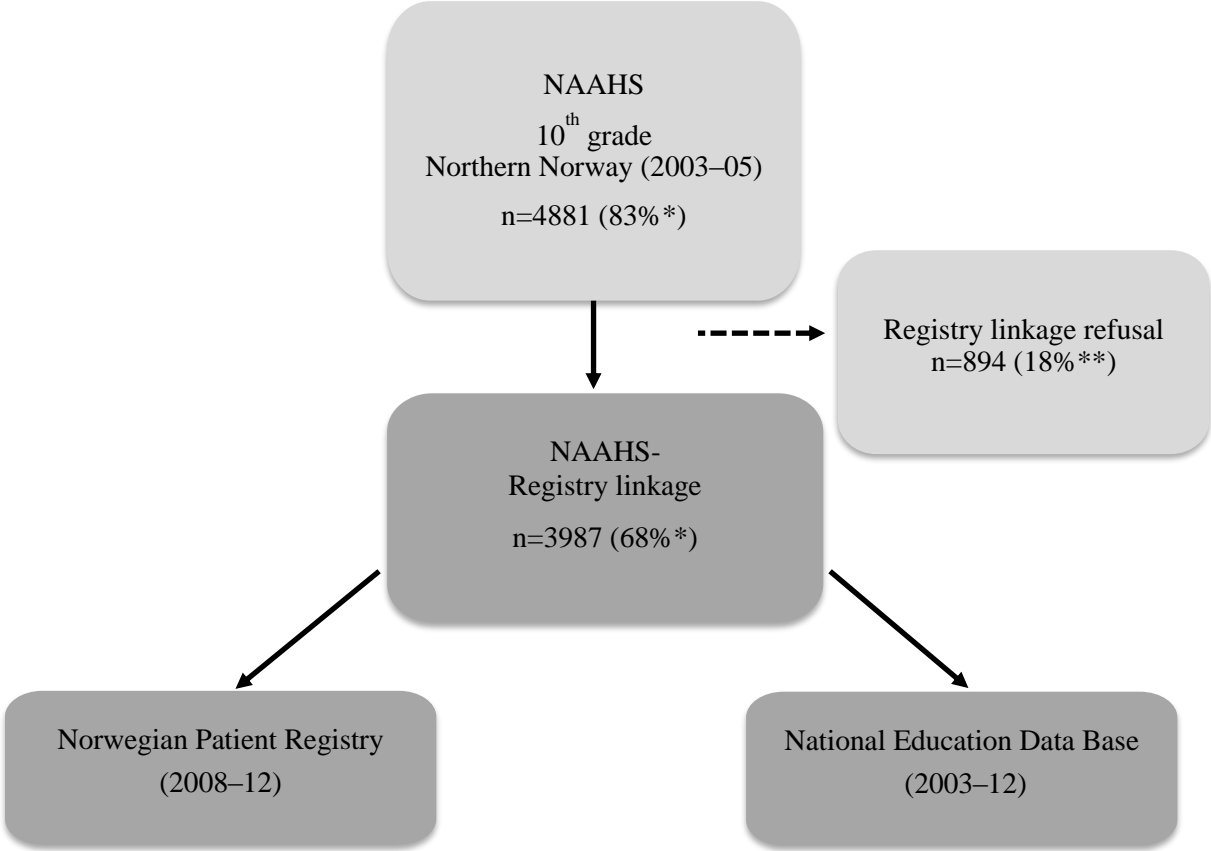


Fig 5 Study design and sample (*of the total population, **of NAAHS participants)



3.2 Measures

Outcome variable from Norwegian Arctic Adolescence Health study (NAAHS study) and National Education Database (NUDB):

Educational aspirations were measured by the question “What is the highest educational level you have planned” from the cross-sectional survey NAAHS, completed 2003–2005. The students could only respond to one option;

“University or university college on high level” (lector, solicitor, civil engineer, dentist, doctor, psychologists, civil economist) (1); “University or university college on middle level” (Norwegian university degree (3.5–4.5 years), teacher, social worker, nurse, police, engineer, journalist) (2); “High school diploma level” (3); “Vocational education on upper secondary school level (chef, hairdresser, builder, electrician, assistant in health and social care etc.) (4); “One year in high school” (5); “Other: open spot to fill in by pen” (6); “I have not decided” (7).

The options were recoded into four categories: higher level (1), intermediate level (2), lower level (3), and undecided (4) (undetermined on the choice of profession).

Completion of upper secondary school is defined as achieving a complete upper secondary school diploma within five years after completing lower secondary school. Not having completed upper secondary school within five years after secondary school was defined as “non-completion”.

Completed tertiary education is defined as “Higher educational level” (University, 5 years and longer) (1); “Intermediate educational level” (University, 3–5 years) (2); “Lower educational level” (Vocational level) (3), and “Not-completed education” (Other) (4). The four categories are not ordinal, but represent four different levels

Explanatory variables from Norwegian Arctic Adolescence Health study (NAAHS study), National Education Database (NUDB) and National Patient Register (NPR):

Sociodemographic and socio-cultural factors

Gender. Female and male gender.

Residency refers to the county where the adolescent lived during lower secondary school. The three northernmost counties in Norway were compared: Nordland, Troms and Finnmark, of which Finnmark County is the northernmost, most remote and most sparsely populated.

Sami ethnicity was measured by an assessment of parents' ethnicity, Sami language competence in parents, grandparents and the participants, and ethnic self-identification. Participants who had one or more of these affiliations present were classified as having Sami ethnicity (83).

Laestadian affiliation was measured by the youths' reports on their own, the parents' or the grandparents' affiliation to the Laestadian religious movement. Participants having one or more of the affiliations were classified as having Laestadian affiliation.

Socioeconomic status (SES): Information regarding the occupation of the participants' parents was obtained and classified according to the International Standard Classification of Occupation (84), ISCO-88, and was subsequently reclassified into five categories for each parent (here labelled SES-father and SES-mother). The following categories were used: (1) "Higher administrative position," (2) "Intermediate position," (3) "Lower administrative position," (4) "Primary industry," and (5) "Blue-collar worker". Those whose positions were unknown being small in number and classified in the missing group. Option (2) is described as a medium administrative position, as the other administrative positions are described as higher and lower.

Parental educational level

Parents' education, registered when the participants were 15–16 years, was used. Parents' highest accomplished year of education was obtained from Statistics Norway's register on education. In the analyses, parents' education was categorized as "Higher educational level" (University, 5 years and longer) (1); "Intermediate educational level" (University, 3–5 years) (2); "Lower educational level/ upper secondary school (vocational level) (3), and "Lower secondary school" (4). Parental higher educational level (1) was the reference group.

Family financial situation was measured by the adolescents' self-report, and categorized as: "Poor" (1), "Average" (2), "Good" (3) and "Very good" (4).

Psychosocial factors

Peer support (Cronbach's alpha = .84) was measured by a scale from the NorHealth statistics bank of the Norwegian Institute of Public Health (<http://www.norges-helsa.no>), which was based on the following four statements: "I feel closely attached to my friends," "My friends value my opinions," "I can help/support my friends," and "I can count on my friends when I need help." This study used a four-point Likert scale that ranged from "Completely agree" (1) to "Completely disagree" (4) and that was operationalized on the basis of the mean.

Parental support (Cronbach's alpha = .88) was measured by a scale from the NorHealth statistics bank of the Norwegian Institute of Public Health, which was based on the following five statements: "I feel attached to my family," "My family takes me seriously," "My family values my opinions," "I mean a lot to my family," and "I can count on my family when I need help." This measure used a four-point Likert scale that ranged from "Completely agree" (1) to "Completely disagree" (4) and that was operationalized on the basis of the mean.

Parental involvement was measured by a scale that was based on a four-item version of the Parental Involvement Scale (Cronbach's alpha = .78) by Alsaker and colleagues (85) and that contained the following statements: "My parents know where I am at and what I do on the weekend," "My parents know where I am and what I do on weekdays," "My parents know who I spend my leisure time with," and "My parents like the friends I spend time with." This variable was measured with the use of a four-point Likert scale that ranged from "Completely agree" (1) to "Completely disagree" (4) and that was operationalized on the basis of the mean.

Class affiliation (Cronbach's alpha = .79), which assessed each student's social standing in and opinion of school, was measured by a scale from the NorHealth statistics bank of the Norwegian Institute of Public Health and was based on the following four statements: "I like it at school," "I have much in common with my fellow school mates," "I feel attached to my school class," and "My class friends value my opinions." This study used a four-point Likert scale that ranged from "Completely agree" (0) to "Completely disagree" (3) and that was operationalized on the basis of the mean.

Teacher affiliation (Cronbach's alpha = .80) was measured by a scale from the NorHealth statistics bank of the Norwegian Institute of Public Health, which was based on the following

four statements: “Teachers value my opinions,” “Teachers appreciate me,” “Teachers help me with school work when needed,” and “Teachers help me with personal problems when needed.” This measure was based on a four-point Likert scale that ranged from “Completely agree” (0) to “Completely disagree” (3) and that was operationalized on the basis of the mean.

School-related stress (Cronbach’s alpha = .66) was measured by a scale from the NorHealth statistics bank of the Norwegian Institute of Public Health, which was based on the following questions: “Have you ever experienced any of the following: ‘Considerable pressure to succeed at school?’, ‘Considerable pressure from others to succeed/do well at school?’, ‘Difficulty concentrating in class?’, or ‘Difficulty understanding the teacher when he/she is teaching?’” This measure was based on a three-point Likert scale that ranged from “No” (1) to “Yes, often” (3) and that was operationalized on the basis of the mean.

Mental health

The Strength and Difficulties Questionnaire (SDQ) (82) consists of five subscales: the Emotional Symptom Scale (SDQ-emotions; Cronbach’s alpha = .70); the Pro-Social Behaviour Scale (SDQ-pro-social; Cronbach’s alpha = .65) and the Peer Problem Scale (SDQ-peer; Cronbach’s alpha = .52); the Hyperactivity-Inattention Scale (SDQ-hyper; Cronbach’s alpha = .64); the Conduct Problem Scale (SDQ-conduct; Cronbach’s alpha = .47). The subscales have five items each with scores from 0 to 2 on each item, indicating: 0= Not correct, 1= Correct sometimes 2= Totally correct. The Pro-Social subscale has inverse scores. The total score for these subscales ranged from 0 to 10, with the lowest score indicating the least amount of difficulty, and for pro-social behaviour the highest score (up to 10) indicating the least amount of difficulty. Each question was scored from 0 to 2, with 0 indicating no problems and 2 indicating great worries and large problems. The scales were operationalized on the basis of the mean scores of the five questions.

The subscale SDQ-Impact scale (SDQ-impact, Cronbach’s alpha=.69) was used, where a score of 10 implies the greatest functional impairment due to mental health problems in home life, friendships, classroom activities and leisure activities. The scale consisted of 5 questions, and was operationalized by mean score.

Contact with specialist mental health service is measured by 0= no contact, 1= yes, contact either/or both in-patient and out-patient contact.

Educational factors

Average marks are based on the four major subjects: mathematics, Norwegian, English and social sciences in lower secondary school. The Norwegian system of school marks ranges from 1 to 6 (1–2=poor, 3=average, 4=good, 5=very good and 6=excellent). For this variable to be included in the analyses, a reported mark in at least three out of the four subjects must be present.

Reading –and writing difficulties (RWD) is measured by the question “Have professionals stated that you have or have had reading and writing difficulties?” with the following options; “Yes, large problems”, “Yes, medium problems”, and “Yes, some problems”; or “No problems”. Positive score on one of the first three options was scored as “yes” (1).

3.3 Statistical analysis

Statistical analyses were conducted with Statistical Package for the Social Sciences Version SPSS 22. Demographic characteristics were described using Pearson’s chi squared test for categorical data, and Student’s-test and One-way ANOVA for continuous data (Papers I-III), and the Tukey honest significant difference test was used for post hoc analysis (Paper I).

Logistic regression, both binary and multinomial logistic regression analysis was carried out, unadjusted and fully adjusted, for the full sample (Paper I) and stratified for females and males (Papers II-III).

Missing values were handled using multiple imputations (MI) in the first registry data study (Paper II). All variables used in the subsequent analyses were included in the imputation model. One hundred data sets were imputed, as recommended by van Buuren (86). The MI analyses gave substantially the same results as complete case analyses (CC). Based on the experience from Paper II, where the results were substantially the same, complete case (CC) was used in the last study (Paper III).

4. RESULTS

SUMMARY OF RESEARCH PAPERS

Paper I – The influence of mental health, psychosocial factors, and educational skills on the educational aspirations of indigenous Sámi and non-indigenous adolescents in the Arctic

Females showed a fairly equal distribution among the four aspiration levels, but the distribution among males showed greater variation. Compared with males, females had significantly higher educational aspirations to seek education at the master's and bachelor's levels; by contrast, males' aspirations for vocational education were significantly higher. We found no gender differences for the undecided group of adolescents.

The results revealed a significant ethnic difference among undecided adolescents, with non-Sámi adolescents having not decided their aspirations. Adolescents from Nordland, Troms and Finnmark counties differed in their vocational aspirations and being undecided: adolescents from Finnmark county showed significantly higher vocational school aspirations and were also significantly more undecided than adolescents from Nordland and Troms counties.

The non-Laestadian adolescents reported significantly higher masters' level aspirations than the Laestadian adolescents did, but no significant difference was observed for the other three groups.

Educational skills measured by higher average mark were associated with higher aspirations, and lower average mark was associated with lower aspirations. Weaker peer support and stronger parental involvement influenced aspirations in individuals with both higher and lower aspirations. Adolescents with lower rates of hyperactivity/inattentive problems reported higher aspirations, whereas adolescents with emotional problems showed a greater inclination for intermediate aspirations. In addition, males and Sámi adolescents showed lower aspirations, and they were more likely to be located in more remote and northern areas.

Paper II – Non-completion of upper secondary school among female and male young people in an Arctic sociocultural context: The NAAHS study

Non-completion of upper secondary school was fairly equally distributed between genders, with prevalence of 36.9% for females and 36.6%, for males. Sami young people showed a marginal significant association towards non-completion (41.3%) compared to non-Sami counterparts (36.8%)

To ascertain gender-specific predictors of upper secondary completion and non-completion, further analyses were carried out separately for females and males.

There was a significantly higher rate of non-completion of upper secondary among males residing in Finnmark County. Other demographic characteristics, such as Laestadian affiliation, parental socioeconomic status, educational aspirations or reading or writing difficulties showed no significant impact on completion or non-completion in this study.

Functional impairment among males due to mental health problems in lower secondary school (SDQ-impact) predicted drop-out in upper secondary school. Lack of educational aspirations at higher level among males showed an association of non-completion of upper secondary school.

For females, several self-reported mental health symptoms such as peer problems and extensive pro-social behaviour predicted non-completion of upper secondary school, while emotional problems had the opposite outcome.

The impact of parental SES, ethnicity, reading and writing difficulties, Laestadian affiliation and average marks were not significant for non-completion of upper secondary school of any gender in the analyses.

Paper III – Tertiary education and its association with mental health indicators and educational factors among Arctic young adults: the NAAHS cohort study

Tertiary education is significantly associated with completion of upper-secondary school.

Still, this study shows that even young adults with non-completion of upper secondary school completed lower and intermediate tertiary education. Young adults who dropped out of upper secondary school have access to higher education by the legislated 25/5 rule, which gives young adults entitlements and credits for age and relevant work practice. However, a substantial part of the sample with a completed upper secondary education did not complete tertiary education.

Males residing in the northernmost and remote areas are less likely to complete education on the higher level. Males with mental health problems which require specialist health care services are associated with less intermediate and higher level education. In males, completed higher level tertiary education is associated with higher parental educational level, and marginally significantly with higher average marks in lower secondary school.

More conduct problems are associated with female tertiary education on the intermediate and lower level, and where female lower level is negatively associated with higher parental educational level.

We found that ethnicity and religious affiliation through Laestadianism did not show significance for completed tertiary education.

5. DISCUSSION

5.1 Discussion of methods

5.1.1 Study design and sample

The main strength of this study is the linkage of a large population-based study to a registry database. NAAHS is unique by inviting all tenth graders in Northern Norway to participate. One out of 87 lower secondary schools declined participation. There was a high participation rate in the cross-sectional study and also in the registry linkage, with an equal distribution for gender, and representative numbers for ethnicity and religious affiliation through Laestadianism in the population sample and registry sample. These aspects strengthened the validity and generalizability of the study.

The 13% who refused the registry linkage did so at the age of 15–16, when completing the paper-based questionnaires. The young age of the population sample reduced the chance of bias in the registry outcomes, as those who are seriously mentally ill would be more likely lost during a later follow-up. All participants in the population sample were informed that they could withdraw their consent at a later date. No participants have done this so far.

There was one cross-sectional study linked to the registry data, and regarding the time frame of the study, which was two school hours in a classroom setting, there might be other factors influencing the associations found in this study.

5.1.2 Statistical methods and precision

Epidemiological research depends on statistical regression models to explore associations in a population sample that hopefully resemble a true relationship found in the true population. Educational aspirations and achievement represent a complexity in which the relationship between psychosocial factors, mental health and educational factors shows different trajectories. The potentially influencing factors are many, while there is an upper limit to the complexity of regression models that can be derived with any acceptable degree of uncertainty (87). We could have added other important factors, and had to choose some potential explanatory factors.

We had a large sample, both in the cross sectional study and registry data sample, with sufficient power to perform multiple comparisons. A logistic regression model was chosen, as we wanted to show the dynamics of how each characteristic group of adjusting factors (sociodemographic, psychosocial, mental health, and educational factors) influenced the relationship of the respective outcomes (educational aspirations, non-completion of upper

secondary school and completed tertiary education). Statistically not significant factors were generally excluded in the fully adjusted analyses in order to reduce the complexity of the models and highlight the more important factors.

In the first registry data study (Paper II), missing values were handled using multiple imputations (MI). All variables used in the subsequent analyses were included in the imputation model. One hundred data sets were imputed, as recommended by van Buuren (86).

When one adjusts for potential confounders in a regression analysis, the effect usually decreases. For some of the fully adjusted analyses in Paper III, notably adolescent mental health factors for females, the effects increase somewhat in the fully adjusted model. This phenomenon can occur in observational studies, and is plausibly caused by one or more covariates acting partly as suppressors (88). The widths of the confidence intervals remain about the same in the unadjusted and adjusted analyses both in Papers II and III, and the sample size is large compared to the number of covariates, so there are no indications of mathematical instability in the analyses.

5.1.3 The Norwegian Arctic Adolescent Health Study

The population study relied on self-reports with the risk of information bias.

The psychosocial and mental health factors in the NAAHS study included more and less commonly used and validated scales, such as the SDQ-scales (89), and measures less frequently used outside of the Youth Studies (The Norwegian Institute of Public Health. **Youth Studies** [<http://www.fhi.no/artikler/?id=105586>]). The use of validated instruments reduces the chance of measurement error by increasing the validity and objectivity of the measure (90). The less frequently used psychosocial measures make it harder to replicate the findings. Another weakness of these measures is the lack of a time frame for the psychosocial measures. However, most of the psychosocial scales had a high internal consistency.

5.1.4 The Norwegian Patient Registry

The NPR is a high quality national patient registry for specialist care; we found few errors. A natural skepticism must be kept due to the specific diagnostic coding by health practitioners, ICD-10. Diagnostic coding can be a challenge, both in psychiatric and somatic care, and the practitioners' coding tradition can influence the choice of a specific diagnosis. As a result, there is a risk of misclassification in terms of specific diagnoses, a risk in all diagnostic

psychiatric research. However, in this study, it is the use of specialist mental health care system that is questioned. It is not the diagnosis, but the measure of mental health troubles and help seeking behaviour that is important.

When it comes to specialist mental health care users, the registry data sample was only 1.3% lower compared to the total population estimation (13.6% compared to 14.9%). A calculated estimation of mental healthcare users in our missing sample was 17.8%, supporting the notion that non-responders are more troubled. The higher proportion of mental healthcare users in the missing sample supports a mild selection bias, which is difficult to avoid in studies requiring consent.

5.1.5 The National Education Data Base

The registry sample was representative of the total sample and the participants refusing the registry linkage were not different when it came to non-completion of upper secondary school. We had a representative sample of non-completion rate, with an overall non-completion rate of 36% (in the registry sample). The rate is close to 38%, which is the non-completion rate among all youngsters in the same period in Northern Norway according to Statistics Norway, 2016 (throughput statistics from Tom Granseth, SSB; tom.granseth@ssb.no, received 4. August 2016).

In light of these findings, the results of this study are representative of Norwegian adolescents. The relationship between educational aspirations, non-completion of upper secondary school and completed tertiary education is generalizable to other western capitalized countries. Research from different nations has found a relationship between educational aspirations, educational attainment – and achievement, psychosocial and mental health factors supporting this association.

5.2 Discussion of results

5.2.1 Gender differences in education

The gender gap in academic performance is widely recognized (40, 73, 91). Female students perform better academically than male students do, and they more often complete their studies (91). The outcome from this study was unexpected when it comes to gender-wise completion of upper secondary and tertiary education. Our study revealed that both females and males drop out of upper secondary school equally much, and have the same low completion rate of tertiary education.

Our findings of academic aspirations between the females and males were as expected, and in accordance with other studies (18, 25). The study revealed that females had higher academic aspirations, and males higher vocational aspirations. The females did not fulfill their aspirations in this study, while maybe the males found that their aspirations did not require more education. Certain attributes associated with either masculinity or femininity may explain individual differences in achievement motivation (53). Being more independent and competitive corresponds to the stereotypical perceptions of masculinity, while interpersonal skills and cooperation abilities are more typically associated with femininity. However, other typically masculine traits, such as self-confidence, predict achievement and deviant behaviour drop-out (53). Examining how masculine and feminine traits relate to performance may increase an understanding of gender in a different way. Possible reasons for the masculine and feminine traits may be home and school environment, peer culture, differences between the genders in adaptation to the school environment, attitude towards school work and higher self-discipline (92). In our study, findings may indicate that the “feminine” self-discipline is not present, making the effect of aspirations invisible when hit by reality of completion.

5.2.2 Education and socio-economic factors

People with higher education have higher incomes, a larger formal and informal network from which their children may benefit, and more time and resources to support their children in education and career planning (11). This involvement may also strengthen the integration of their children at school and in society, as adolescents growing up with more highly educated parents tend to be better informed in their meetings with school systems and bureaucracy. Parental occupation was found to be of some importance in this study, when it came to educational aspirations, which is well known from other studies. Surprisingly, no such association was found in the study when it concerned non-completion of upper secondary school. However, the same mechanism is found among the young females whose parents with higher education were significantly not supportive of their female offspring completing lower tertiary education and significantly supportive of male offspring to complete higher tertiary education. The limited importance of parental occupation, parental education and financial situation in our data suggests that the significance of social background on academic outcomes may be weaker in Northern Norway than in countries with greater income gaps and less social equality (93). The finding is not surprising given that Norway has a long history of policies and regulations which favor equality at many levels, including education, work and health systems (32).

Still, in egalitarian Norway, parents' level of education and their engagement with and attitudes towards their children's education is crucial for the completion rate among the young adults, affecting both performance and drop-out (24, 73, 93, 94). Among Norwegian students whose parents hold a degree requiring longer tertiary education, 88% complete upper secondary school, compared to 46% of students whose parents have only completed lower secondary school (95).

5.2.3 Education and psychosocial factors

The challenges of social engagement are complex: too many or, too few friends, which is found highly relevant for female drop-out from upper secondary school (96, 97). The challenges include everything from loneliness to bullying (98), as well as over-engagement and stress (96, 97). Scoring high on social competence may indicate being more open to new friendships and nurturing relationships with others, that is, spending more time with friends and less time on school work (99).

The social networks found among religious groups (14), and the Laestadian religious affiliation being strongly associated with Sami ethnicity could be expected to have a great impact on education. In our study, Sami adolescents showed lower aspirations and were more likely to be located in more remote and northern areas. Besides that, ethnicity, and religious affiliation had limited effects on the educational aspirations of the students in this study, which was surprising. There was a strong tendency for Sami adolescents to drop out of upper secondary school compared to majority Norwegians. Religious affiliation did not affect the drop-out rate, but geographical context did. The geographical aspect is underpinned by a national survey, which gave all seven upper-secondary schools in Finnmark County the lowest score on indicators of school quality, including drop-out as a predictor (100).

The findings from our study underpin that means must be directed to the right group of adolescents. Sami adolescents had lower educational aspirations, and showed marginally higher non-completion rate than majority Norwegians. The results from this study suggests that a traditional gender perspective is not precise in this context, rather addressing masculine and feminine traits and risk factors to create changes for education.

5.2.4 Education and mental health problems

Recent systematic reviews (39) confirm that mood and anxiety disorders seem to predict drop-out, but this relationship may be mediated by behaviour problems and academic performance (101). The association between mental health problems, high school drop-out and academic

performance has also previously been shown to be complex (17, 19, 101). Mental health problems and academic outcomes and performance need further examination.

We found in this study that peer support could be an obstacle for both higher and lower aspirations regardless of gender, and that peer problems and over-engaged pro-social behaviour were risk factors among females of non-completion of upper-secondary school.

At the same time, internalizing problems, such as emotional problems were found to be a protective factor for completing upper secondary school. And finally, female conduct problems were associated with lower tertiary education. Males, on the other hand, who had been in contact with specialist mental health care services, had strongly reduced their chances to complete tertiary education on intermediate level. The findings in this study among female and male mental health problems emphasizes their complexity regarding education and a clear gender difference.

5.2.5 Education and educational factors

Average marks are in numerous studies found to be the most significant factor predicting educational outcome (40, 102). In this study, average marks influenced educational aspirations highly. But, for non-completion of upper secondary school and completed tertiary education, average marks from tenth grade showed little impact. The same trend is found for reading and writing difficulties and completion of upper-secondary school and completed tertiary education. Based on this unexpected outcome, it may be relevant to separate students who drop out because of low academic performance from students who quit for other reasons, perhaps as a more voluntary action (77) or as an opportunistic choice (27). Recognizing these two groups of students may help identify predictors that are concealed when examining all drop-out students as one group.

Academic performance has been established as one of the most central predictors also for drop-out at university (103-105). Moreover, poor academic performance has been found to be a mediator of other important predictors, such as socio-economic status and demographics, deviant behaviour, socialization in school and in the family (40) and mental disorders (39). We have seen earlier in the discussion sections (5.2 and onwards) that neither of the other explanatory factors show expected or a one-way trajectory, neither do these educational factors.

5.3 Strengths and limitations

The major strength of this study is the population-based design with a high response rate adding to the generalizability of the study. Data from the cross-sectional study is merged to high quality registry data. The relationship between educational aspirations, non-completion of upper secondary school and tertiary education has not been studied previously in an adolescent and young adult population in Arctic Norway with such a broad variety of individual explanatory factors, seen in a sociocultural context.

The NAAHS survey was conducted during school hours, and in a classroom setting. The physical setting may have affected the response due to selection bias.

Reliability and validity of brief scales, as SDQ, may be questioned (106). Cronbach's alpha was applied as a measure of internal consistency reliability, with a value of .70 or more considered reliable. The Conduct Problems Scale (SDQ-conduct) had a lower value, while subscales such as the Emotional Symptoms Scale (SDQ-emotions), the Pro-Social Behaviour Scale (SDQ-pro-social), the SDQ-Impact Scale (SDQ-impact) and, the Hyperactivity Scale (SDQ-hyper) could be considered reliable.

The Peer Problem Scale (SDQ-peer) had lower value with Cronbach's alpha = .52, and the validity of SDQ-peer as a psychometric tool is also questioned for certain ethnic groups of children due to the lack of sociocultural sensitivity. Williamson et al. (107) exemplifies the poor fit by the lack of questions of connection to extended family, ethnic identity as well as the impact and experience of racism.

Parental socio-economic status was measured by occupation. The strength is that occupations can reflect the educational level, and to some degree income level. The weakness of occupational SES is that it is not a clear indicator of parental educational level (Papers I and II). The socioeconomic perspective was strengthened in Paper III, when family finances were included, based on self-report from the adolescents in NAAHS and parental education from NUDB was included.

The NAAHS data were collected 4–10 years before the outcome data in NUDB and NPR, which limited the possibility of examining the development of the predictors in late lower secondary school, during upper secondary school and into tertiary education. Future surveys should use a longitudinal follow-up design to examine the development of predictors during upper secondary school. The National Education Data base (NUDB) includes

information and outcomes pertaining to all aspects of education, from primary school to higher education. The outcome variable is therefore considered reliable.

Data from NUDB reaches a time limit as this thesis is ending. However, many young people will complete tertiary education later, and the results on tertiary education are limited as the young adults still are only between 23–25 years old.



“The Wizard of changes”

6. CONCLUSION AND FUTURE PERSPECTIVES

A social democratic welfare state like Norway, with its redistributive and tax-funded social security for health and education is totally dependent on the work approach. The work approach is a prolonged political consensus with roots back to the red-green alliance from before World War II. Our universal and generous social and financial entitlements require a working population. Another supposed positive effect of the work approach is lower expenses for social welfare benefits and unemployment cost. The advantages for the individual include a more stable work situation, better income, better health and well-being. These benefits have been acknowledged for a long time. Norwegian adolescents have the right to attend upper secondary school because of these advantages. We also have a low threshold for entering higher education and a principle that education should be free of charge. Equal opportunities for all to start an education are thus good. Still, the drop-out rates are high in upper secondary school and completion rate low in tertiary education, even after several years with a broad focus on the problem from academia, the government, politicians, teachers and school administrations. Extensive research on different aspects of educational attainment and performance is central in order to identify why education matters so much, and how to secure adequate levels of education for the population. Legislated rules and entitlements might affect education in different directions. The legislated 25/5 rule, from 2005, which enables the young adult to attend tertiary education has shown a positive effect, while the drop-out rate in upper secondary school has increased since 1994, when high school was a legislated entitlement.

There are some fixed factors which are important for academic performance and student status. Average marks have been found to be a constant factor, also in this study in connection with self-reported educational aspirations, and to some degree, completion of upper secondary school. Socio-economic status, by occupation and/ or financial situation was found to have some influence on education, but not as clearly as other studies have shown.

Whether geographical factors are fixed or not is an issue to discuss. Our thesis has shown that educational aspirations and achievement are strongly related to geographical periphery. Geographical challenges should be addressed in further interventions to prevent high school drop-out and lack of awarded qualification, as tertiary education.

One particular aspect of the Norwegian school administration should be addressed. Norway has a three-tier system in which the 19 counties are politically and administratively in charge

of upper secondary school. One could question this competence of the counties as drop-out rates are consistent and absolutely highest in the remote and sparsely populated Arctic Norway. Local authorities, i.e. the municipalities, or the national administration could prove more successful in reducing the drop-out rates.

Arctic Norway, and its socio-cultural contexts, also includes the school history of indigenous Sami, of whom many have Laestadian affiliation, and can thereby be seen in a minority, periphery and masculinity perspective. The majority society faces great challenges in using the resources and capital in educating and increasing job opportunities. However, the rural and peripheral north have extensive primary industry with resources such as fishery, fish herding and reindeer herding. The entitlement and qualifications required by these often self-employed ways of living is not offered in public schools or higher education. Further research on means and ways to develop this obvious connection is needed as the lack of aspirations, drop-out from school and not completing tertiary education limits further growth and prosperity, and is maybe the most important public health issue among young adults in Arctic Norway.

The changeable field of psychosocial and mental health, and the interplay between the individual and family, school, peers and other social networks were found to influence females and males in different ways and to different degrees.

Interventions for the changeable factors do not need to be offered only to individuals. This thesis emphasizes how parents, teacher and low threshold health and social care groups can improve matters for the individual and also school groups.

One great challenge within the field of school and public health research is getting a closer cooperation between school administration, researchers and primary industry services. Many of the challenges within the primary industry, both financially and health-wise, demand a closer cooperation between the different fields. When you see the use and need of new knowledge, and an acknowledgement of your knowhow, there can be a synergy, benefitting the individual, the industries and municipalities as such.

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PAPER I-III

Candidate Contributorship Statement

Educational Footprints and Psychosocial Factors in Multicultural Contexts in Arctic Norway

A Cohort and Registry Data Study among Sami and Non-Sami Students, 2003–2012

Elisabeth Valmyr Bania

The candidate has participated in the concept and design of the registry linkage of the Norwegian Arctic Adolescent Health Study and the acquisition of the registry data. The candidate has organized The National Education Data Base, and taken part in organizing the registry data from the Norwegian Patient Registry.

The candidate is the first author of Papers I, II and III, constituting this thesis. She has contributed in analysis and interpretation of the data, drafting and revising the manuscripts.

Candidate

Elisabeth V. Bania
Elisabeth Valmyr Bania

Main supervisor

Siv Kvernmo
Siv Kvernmo