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The association between suicidal behaviour and violence, sexual abuse, and parental substance abuse among Sami and Greenlandic adolescents: the WBYG study and the NAAHS

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Abstract

Background: For young Indigenous people, suicide is one of the leading causes of death, and high rates in Arctic areas indicate serious health and societal concerns. More knowledge is needed, as suicidal behaviour predicts later death by suicide. The aim of this study was to investigate associations between suicidal thoughts and suicide attempts and negative life events, including violence, sexual abuse, and parental substance abuse, in Sami and Greenlandic adolescents, within and between groups and gender.
Method: Working samples included 442 Sami and 399 Greenlandic Inuit (15–16-year-olds), in The Norwegian Arctic Adolescent Health Study (NAAHS) and the Well-Being among Youth in Greenland (WBYG) study. Multivariable logistic regression explored associations between suicidal behaviour and violence, sexual abuse, and parental substance abuse.
Results: Across Indigenous groups, suicidal thoughts and attempts were significantly associated with violence and sexual abuse. The association between suicidal behaviour; especially suicidal thoughts, and sexual abuse was significant and strong among Sami females. Sami and Inuit adolescents with a history of childhood violence reported significantly more suicide attempts; the strongest association was found among Sami males.
Conclusion: To Sami and Greenlandic Inuit, the experiences of negative life events, such as violence or sexual abuse are significant risk factors for suicidal behaviour. Public health programmes and prevention strategies targeting youth mental health and suicide should be culturally sensitive and sensitive to gender differences in the association between negative life events and suicidal behaviour.

Keywords: Suicidal behaviour, Sami, Greenlandic Inuit, violence, sexual abuse, adolescents

Introduction

Studies among Indigenous peoples in Alaska, Canada, and Greenland indicate that the colonial legacy of cultural loss, historical oppression, and loss of language is connected to substance misuse, sexual abuse, and suicide (1, 2). This connection is based on the understanding that losses of Indigenous individuals and communities are equivalent to the loss of role and status in a large-scale urban society, which may diminish self-esteem and self-efficacy. Also, as cultural and historical knowledge contributes to the construction of ethnic identity and thereby to mental health (2), these types of knowledge might be an example of how the history of colonisation affects mental health today. Modern psychosocial problems are superimposed upon a background of historically traumatic losses across generations (3). Among First Nations adolescents in Canada with a parent who attended Indian Residential School (IRS), 26 per cent had thought about suicide, compared to 18 per cent of adolescents with a non-IRS parent (4).

An important risk factor for completed suicide is a history of suicide attempts (5). Suicide attempts or completed suicides are associated with adverse childhood experiences (ACEs), also in Indigenous and non-Indigenous adolescent and adult populations (6-10). One definition of ACEs includes child abuse, neglect and household dysfunction (11).

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Kirmayer, Malus (12) found that physical abuse and having a parent with an alcohol or drug problem were some of the factors associated with attempted suicide and suicidal ideation among 14–25-year-old Inuit in northern Quebec. For the Inuit in Nunavut, early life adversities, such as childhood sexual abuse, are major risk factors for completed suicide (13). Ottendahl, Bjerregaard (14) found a significant association between the number of ACEs, suicidal thoughts, and suicide attempts among young Inuit aged 15–34. Among American Indian adolescents and young adults, similar findings show that each additional ACE increases the odds of a suicide attempt (15). Although epidemiological survey data on Indigenous populations is of elevated rates of mental disorders in many communities, the data also indicate great resilience (16). Personal and cultural continuity has a role as a protective factor against suicide. Self-continuity goes missing for adolescents transitioning into adulthood. If one´s culture, which is so important for one's identity, is also thrown into severe disarray, the result might be indifference towards one´s own death (17). Therefore, Chandler and Lalonde (17) hypothesise that protecting and rehabilitating the continuity of the culture might work as protective factors against suicide.

The Sami people

The Sami population is estimated at approx. 80–100,000 inhabitants of northern Scandinavia and the Russian Kola Peninsula, with the majority (approx. 70%) living in Norway as formally considered Indigenous people with their own culture and native language (18). Most of the Sami in Norway live in the Arctic part of the country, Sápmi, with the highest Sami density in Finnmark's highlands. The Sami were originally hunters and fishermen, but today they make their living from semi-nomadic reindeer herding, agriculture, fishing, and modern occupations (19). Historically, the Sami have been under the heavy pressure of colonisation and assimilation, resulting in a break of continuity in ethnic language, culture, religion, and identity for many Sami (19, 20).

Since the 1950´s, the education level of Sami has increased considerably, fostering generations of Sami resisting assimilation and claiming Indigenous rights. In the past few decades, a strong cultural revitalisation increased awareness of Sami traditions as a valued part of Norwegian society, nation-building, and pride among Sami. In 1989 the Sami people in Norway formed their Sami parliament, an assembly of Sami representatives which promotes Sami interests (21). Despite this development, many Sami people still experience discrimination, particularly those with a strong Sami affiliation (22).

The Greenlandic people

Among the approximately 57,000 inhabitants in Greenland, the native population, Inuit, comprise more than 90 per cent of the population (23, 24). In the present paper, the Greenlandic participants will be referred to as Greenlandic and Inuit.

In 1721, the Norwegian priest Hans Egede initiated a colonising period where Greenland became a Danish Christian colony, ending formally in 1979 when Denmark granted home rule to Greenland (24, 25) and self-government in 2009 (26).

Greenland has a low population density, limited infrastructure, and demographic challenges (27). As a society with strong interrelations between the human and natural environments, Greenland has transitioned from subsistence hunting and fishing to an economy based on wage-earning (27, 28). Greenlandic is the dominant language, but Danish is used in higher education.

Comparing Sami and Inuit adolescents

Like many other Indigenous populations, the Greenlandic and Sami populations have experienced assimilation and colonisation (29-31). However, although they share some common characteristics, Sápmi and Greenland differ because of the length of the colonisation and speed of social change, their present political and economic situations, and the prevalence of suicidal behaviour. The Sami are the Indigenous people of Norway but in a minority position, while the Inuit are the Indigenous people and the majority population in Greenland (31, 32). However, aspects of economic and cultural colonisation persist for the Inuit people in Greenland (26). A greater proportion of Inuit people in Greenland speak their Indigenous language than Sami in Sápmi. The infrastructure also differs with less geographical isolation, greater accessibility to health services, higher education, and the labour market in Sápmi compared to Greenland. These similarities and differences may affect Sami and Inuit adolescents´ health and well-being and their families´ ability to support their offspring.

Health research on Indigenous people had not been regulated until recent years, giving numerous examples of unethical practices. Today, there are ethical guidelines for doing research on the health of both Sami and Inuit people (33, 34).

Violence, sexual abuse, and parental alcohol abuse

Globally, exposure to violence is a salient concern among Indigenous communities (35), and has been linked to sexual abuse (36). American Indian and Alaska Native (AIAN) communities suffer from some of the highest rates of lifetime traumatic events, including interpersonal violence, child abuse and

neglect, and negative stereotypes (37). Research provides support for an intergenerational cycle of violence among Indigenous people, for example, having observed domestic violence as a child increased the odds of being a victim of partner violence as an adult (including physical, psychological, or sexual harm) (38).

In a study based on SAMINOR 2, which was a population-based study, almost half of the adult Sami female respondents and one-third of the adult non-Sami female respondents reported violence of any kind during their lifetime (emotional, physical, and sexual violence) (39). In the same study, more than one-third of the Sami men, compared with less than a quarter of the non-Sami men, reported having experienced violence (39). Furthermore, Eriksen, Hansen (40) found that significantly more Sami women and men than non-Sami reported childhood violence exposure, and the perpetrator was typically known to the victim.

Curtis, Larsen (36) showed that 13 per cent of Greenlandic females aged 18–24 reported sexual abuse as a child, compared to 3 per cent among male counterparts. Further, the researchers saw a correlation between sexual abuse as a child and alcohol-related problems in the home (36). In Greenland, child sexual abuse often happens when the parents are unable to control what is happening in a home steeped in alcohol (41, 42). For Greenlandic adolescents, the combination of alcohol problems in the family and childhood sexual abuse has been found to be the most important suicide predictor (43, 44). Many abstainers, few regular drinkers, and widespread binge drinking characterise the drinking pattern of Greenland Inuit. Exposure to domestic alcohol problems and sexual abuse in childhood paralleled the recorded colonial import of alcohol and was a likely cause of transgenerational consequences such as youth suicides and alcohol problems (45). In Norway, there is higher parental abstinence among Sami parents compared to majority parents, which might have to do with the Laestadianism´s profound impact on Sami culture, and it´s strong anti-alcohol norms (46, 47).

Prevalence and correlates of suicidal behaviour among Sami and Inuit adolescents

Suicidal behaviour among circumpolar Indigenous adolescents is a particular challenge in rural and remote communities (48, 49). Suicide attempts are generally more prevalent among females than males, and this pattern has also been found among Sami and Greenlandic adolescents. Sami female adolescents were twice as likely as males to report having ever made a suicide attempt (14 % vs. 7 %) (50), and for Greenlandic counterparts, the numbers were 33 per cent females and 9 per cent males (49). A study on young Sami health and well-being in 2019/2020 shows that 20 per cent of Sami females and 15 per cent of Sami males had made a suicide attempt, and that about one in four Sami males and females struggle to some degree with suicidal thoughts (51).

The Greenlandic Population Survey from 2018 showed that 13 per cent of females and 5 per cent of males aged 15–24 had attempted suicide during the past year (52). Among Inuit in the age group 18–29, more than one in four males and females had ever had suicidal thoughts and/or attempted suicide (23).

A previous study found that Sami male adolescents reported more suicidal thoughts than their Greenlandic counterparts (49). Ever having had suicidal thoughts was reported by 27 per cent vs. 19 per cent of Sami and Inuit male adolescents, respectively, and by 51 per cent vs. 52 per cent of female counterparts (49). Suicidal thoughts in the past year were reported by almost one-fourth of Greenlandic females aged 15–25, and 11 per cent of male counterparts (52).

Most suicide attempts in Greenland seem to be triggered by a personal or social crisis (53). In previous analyses from the Well-Being among Youth in Greenland (WBYG) study, loneliness or living away from home were among the leading causes of suicide attempts among Greenlandic males, while sexual abuse was the main cause among Greenlandic females, and for both genders, serious suicidal thoughts were correlated with having been assaulted or abused (49, 54, 55). Among Sami adolescents, being alcohol intoxicated, living in a single-parent home or with a stepparent, and reporting parental overprotection were all associated with self-reported suicide attempts (49, 50). Furthermore, the suicide of a person close to you has also been found to be associated with suicidal behaviour among both Inuit and Sami adolescents (49).

Aims of the present study

This study investigates the association between suicidal behaviour and risk factors: violence, sexual abuse, and parental substance abuse among Sami and Inuit adolescents, aiming to increase the understanding of suicidal behaviour in Arctic Indigenous adolescents of Scandinavia. A strengthening factor is that the study questionnaires used in the Norwegian Arctic Adolescent Health Study (NAAHS) and in the Well-Being Among Youth in Greenland (WBYG) study were developed in close collaboration. Both studies included many participants, providing a large population of Indigenous youth and a unique opportunity to investigate both shared and group-specific associations of suicidal behaviour in two Arctic/Scandinavian Indigenous adolescent populations.

First, we aimed to explore the association between suicidal behaviour and violence, sexual abuse, and parental substance abuse among Sami and Greenlandic adolescents, adjusting for socio-demographic factors, living situation, and context. Secondly, we compared the outcomes in the two ethnic groups, and finally, we explored gender differences.

Materials and method

Sample

Cross-sectional self-reported data from two school-based studies: the Norwegian Arctic Adolescent Health Study, (NAAHS) and the Well-Being Among Youth in Greenland, (WBYG) were used. The NAAHS was a study on health and living conditions among all 10th graders in the three northernmost counties of Norway. The NAAHS was conducted in 2003–2005 among 4,880 students. In total, all 15- to 16-year-old students (10th graders) were invited and 83% of them participated. All junior high schools (292), except for one, agreed to participate. The questionnaires included somatic health complaints, use of health services, food habits, physical activity, schooling and educational plans, cultural activities and traditions, sexual behaviour and preferences, as well as broader mental health issues and risk-taking behaviours including self-efficacy, stress and coping, anxiety and depression, substance use, self-harm and suicidal behaviour, bullying, and sexual abuse. The number of Sami students varied from school to school, with the highest percentage in the schools in the Sami-dominated areas of Finnmark. On average, approximately 10% of the sample was Sami (n=442), which is equivalent to the proportion found in the general population.

The WBYG study was designed to investigate the well-being, health behaviour and health among adolescents in Greenland (2004-05). The WBYG study included socio-demographic factors, family and upbringing conditions, social relations, school and leisure time factors, health behaviour, physical and mental health with a special focus on suicidal behaviour, sexual behaviour, and sexual abuse. In the WBYG study, 663 students from 10 schools above the age of 14 in grades 10 and 11 were invited to participate in the study (RR of 75%). The selection of schools was based on the desire to represent all regions in Greenland, to include adolescents in the smaller communities, and to include schools with a high number of students (55).

Working samples were selected based on age comparison and Indigenous membership. In total, 841 adolescents aged 15-16 were included in the present study, 442 Sami and 399 Inuit.

Ethnicity

In the NAAHS, objective ethnic affiliation was classified as Sami if one parent's ethnicity was reported as Sami or if at least one of the grandparents' or parents' languages was reported as Sami (56). The questions had the following options: Norwegian, Sami, Kven, Finnish, and Other. Multiple answers were allowed. Respondents were categorised as Sami if they answered Sami on one of them. Subjective Sami ethnic affiliation was based on the 4-point scale question: I regard myself as Norwegian/Sami/Kven/Finnish/Other with the options Fully agree, or Nearly fully agree, on the Sami option and a report of Sami to the question: My ethnicity is? Multiple answers were allowed. The participants who regarded themselves Sami, without reporting Sami objective ethnic affiliation (n = 89), those with only objective ethnic affiliation (n = 121), and those with both subjective and objective Sami ethnicity (n = 232) were included in this study as Sami.

In the WBYG study, objective Inuit ethnic affiliation was registered if either the participant (Were you born in Greenland?), their mother (Was your mother born in Greenland?) or father (Was your father born in Greenland?) was born in Greenland. Options were Yes or No. Subjective Inuit ethnic affiliation was based on the question: Would you describe yourself as a Greenlander or a Dane? Included in the Inuit group were those who answered Greenlandic or Both Greenlandic and Dane. We excluded those defining themselves as Only Danish (n = 12), Something else (n = 4), and I don´t know (n = 16), unless they reported objective Inuit ethnic affiliation (n = 15). In total, 17 were excluded due to lack of Inuit affiliation. Inclusion criteria for Indigenous ethnic affiliation (Sami or Inuit) was either subjective ethnic affiliation, objective ethnic affiliation, or both. Ethnic affiliation was categorised as Sami or Inuit.

Instruments

Outcome variables

Suicidal behaviour

NAAHS: Suicidal thoughts were based on the question: Have you ever thought about taking your own life? and suicide attempts were based on the question: Have you ever tried to take your own life?, both with options Yes or No.

WBYG: Suicidal thoughts were based on the question: Have you ever seriously thought about taking your own life? Suicide attempts were based on the question: Have you ever attempted suicide?, with options Yes or No for both questions.

Explanatory variables

Experienced violence

NAAHS: Participants were asked: Have you been exposed to violence (been hit, kicked, or similar) during the last 12 months?, with the following options: Never, Yes, only by youth, Yes, only by adults, Yes, by both youth and adults.

WBYG: Participants were asked: Within the last year have you been exposed to any of the following? (Violence was one of ten alternatives), with options Yes or No. Participants were also asked: Most children experience conflicts at home. Have you experienced being pushed or shaken in anger? Have you had your hair pulled? Have you been beaten? Have you experienced some other violent action?, with option Yes or No to answer each of the questions.

NAAHS/WBYG: Participants who answered No to Violence and Domestic violence in the last year were considered to not have experienced violence. Participants who answered Yes to either Violence or Domestic violence were considered to have experienced violence in the last year.

Sexual abuse

NAAHS: Participants were asked: Have you experienced sexual abuse in the past 12 months? (e.g., blotting, groping, non-consensual intercourse), with options Yes or No.

WBYG: Participants were asked several questions regarding sexual experiences, followed by two questions: Did you experience at the time that it was sexual abuse? and Do you experience today that what happened was sexual abuse?, with options Yes, Maybe, No, I don't know. Participants who answered Yes or Maybe on one or both were categorised as Yes. Those who responded with No or I don't know on both were categorised as No.

Parents' alcohol/substance abuse

NAAHS: Participants were asked: Have you, during the past 12 months, had any of these issues?, with Substance problems among parents/ legal guardians as one of the problems, with options No, Never, Yes, Sometimes, Multiple times, or Very often.

WBYG: Participants were asked: Have you experienced misuse of alcohol in your closest family?, with options Yes or No.

NAAHS/WBYG: Participants who answered Yes, Sometimes, Multiple times, Very often or Yes were considered to have parents or close family with alcohol/substance abuse = Yes, while participants answering No were considered not to have parents or close family with alcohol/substance abuse = No.

Gender

Gender was measured based on self-report: Male or Female.

Family situation

NAAHS/WBYG: Study participants were asked: Who do you live with at the moment?

NAAHS: Options were: Mother and father, Only mother, Only father, Equally with mother and with father, Mother or father with new partner, Foster parents, or Others.

WBYG: Options were: Mother/adoptive mother, Father/adoptive father, Mother´s new partner, Father´s new partner, Foster parents, Grandparents/adult siblings/other family, Other adults (not family), School home, Orphanage. Participants could tick off one or several alternatives.

For both studies, four categories were made for the family situation: 1 = Mother/adoptive mother and father/adoptive father, 2 = Only mother or father or shared living, 3 = Mother or father with new partner, 4 = Living outside the biological family.

Rural/urban living

NAAHS: Urban living: the participant's school is in a city or municipality with more than 10,000 inhabitants. Rural living: municipality with less than 10,000 inhabitants.

WBYG: Participants were asked: Where did you live when you were 10 years old? In a large community in Greenland, in a small community in Greenland or not in Greenland?, with the following options: In a large community in Greenland, In a small community in Greenland, or Not in Greenland. Urban living: In a large community in Greenland or Not in Greenland, and for Rural living: In a small community.

Statistical analysis

SPSS version 26 was used for statistical analysis. Descriptive statistics were used to present the distribution of negative life events and socio-demographic variables by ethnicity and gender (Table 1). The chi square test was used to evaluate both Sami-Inuit and in-group differences in the distribution of covariates (Table 1). The level of significance was set to $p \leq 0.05$.

Logistic regressions were performed both with suicidal thoughts and suicide attempt as the binary dependent variable. Associations between suicidal thoughts or suicide attempts and each explanatory factor were explored by simple logistic regressions, and separately for Sami and Inuit.

Tables 2 and 3 show unadjusted (bivariate) and adjusted (multiple logistic regression analysis) models of suicidal thoughts and suicide attempts, respectively, in Sami and Greenlandic adolescents.

The unadjusted model shows crude OR for suicidal thoughts and suicide attempts in Table 2 and Table 3, respectively. In the adjusted model, all variables included in the model are adjusted for each other (tables 2 and 3).
Finally, separate gender analyses were carried out within each Indigenous group (tables 4 and 5).

Results

Distribution of negative life events and socio-demographic correlates by ethnicity and gender
Without stratifying by gender, significant Sami-Inuit group differences occurred for socio-demographic variables and parental substance abuse, while not for experienced violence and experienced sexual abuse (Table 1).

Negative life events

Nine times more Inuit reported substance abuse among parents compared to Sami: 62 per cent versus 7 per cent, respectively.

Among both the Sami and Inuit adolescents, similar gender differences occurred for experienced violence and sexual abuse (Table 1). More Sami males (26%) than females (18%) reported experiences of violence, while more than twice as many Sami females (9%) compared to males (4%) reported sexual abuse.

Inuit females were more likely than Inuit males to report sexual abuse: 15 per cent versus 1 per cent, respectively. Inuit females also reported more substance abuse among parents compared to Inuit males: 67 per cent versus 54 per cent, respectively.

Socio-demographic correlates

Overall, twice as many Sami (48%) compared with Inuit (24%) reported urban living and more Sami reported living with both parents compared with Inuit: 62 per cent versus 42 per cent, respectively. Seven times more Inuit (18%) live outside the biological family compared to Sami (3%).

More than twice as many Inuit males (10%) than females (4%) live in a stepparent family, while more Inuit females (34%) than males (25%) live in a single-parent home. More Inuit males (23%) than females (17%) live away from their biological family. The distribution of socio-demographic correlates was similar between Sami females and males.

Prevalence of suicidal behaviour by ethnicity and gender

Both Indigenous groups combined

Across the Indigenous groups, suicidal thoughts were reported by nearly 40 per cent of respondents and suicide attempts by 17 per cent (Table 1).

Twice as many Inuit females had attempted suicide compared to Sami counterparts (33% vs. 16%), while the prevalence of suicide attempts was nearly similar between Inuit and Sami males: 9 per cent vs. 7 per cent, respectively. Sami males reported suicidal thoughts more often than Inuit males: 27 per cent vs. 19 per cent, respectively.

Across Indigenous groups, females reported more suicidal thoughts and suicide attempts than males (Table 1). In the Sami group, around 20 per cent more females than males reported suicidal thoughts, and 10 per cent more females than males reported suicide attempts. In the Inuit group, around 30 per cent more females than males reported suicidal thoughts, and 20 per cent more females than males reported suicide attempts.

Multiple logistic regression analyses: negative life events and socio-demographic correlates associated with suicidal behaviour by Indigenous group
Shared associations across Indigenous groups. Only statistically significant associations are reported, controlled for all explanatory variables in the model, unless otherwise stated.
Among both Sami and Inuit adolescents, violence was associated with two- to three-times higher odds of reporting suicidal thoughts and three- to four-times higher odds of reporting suicide attempts (tables 2 and 3).

Adolescents in both Indigenous groups who reported sexual abuse were more at risk of suicidal behaviour. Sami adolescents had seven- to eight-times higher odds of reporting suicidal thoughts and attempts, while the risk for either type of suicidal behaviour was doubled for Inuit adolescents who had experienced sexual abuse.

In both Indigenous groups, gender was associated with higher risk of suicidal behaviour. In the Sami group, females had a three-times higher risk of suicidal thoughts and attempts, and Inuit females had a four-times higher risk than their male counterparts.

Indigenous group-specific associations

Among Inuit, parental substance abuse was associated with doubled odds of reporting both suicidal thoughts and attempts, but only in the unadjusted model. Further, living outside the biological family was associated with doubled odds of reporting suicidal thoughts among Inuit in the unadjusted model and showed a non-significant ($p>.5$) tendency in the adjusted model. Living in a single-parent family was associated with higher odds of reporting suicidal thoughts among Inuit in the unadjusted model.

Among Sami adolescents, living in a stepparent family was associated with five-times higher odds of reporting suicidal thoughts and three-times higher odds of suicide attempts.

TABLE 1. Distribution of outcome and associated variables by ethnicity and gender.

	Sami (NAAHS)							*Inuit (WBYG)*							*Sami/Inuit*
	Female		*Male*		*Total*		*Effect of gender*	*Female*		*Male*		*Total*		*Effect of gender*	*Effect of ethnicity*
	N	*%*	*N*	*%*	*N*	*%*	$X^{2/p}$	*N*	*%*	*N*	*%*	*N*	*%*	$X^{2/p}$	$X^{2/p}$
Outcome variables															
Suicidal behavior															
Suicidal thoughts	108	50.7	58	26.7	166	37.6	$26.07^{p<.001}$	116	51.8	30	18.6	146	36.6	$43.73^{p<.001}$	$.026^{.873}$
No suicidal thoughts	105	49.3	159	73.3	264	59.7		108	48.2	131	81.4	239	59.9		
Suicide attempts	35	16.4	7.4	16	51	11.5	$8.34^{.004}$	75	33.3	15	9.3	90	22.6	$30.28^{p<.001}$	$19.17^{p<.001}$
No suicide attempts	178	83.6	200	92.6	378	85.5		150	66.7	146	90.7	296	74.2		
Negative life events															
Experienced violence	39	18.1	58	26.1	97	22.2	$4.03^{.045}$	48	20.8	29	17.3	77	19.3	$.77^{.379}$	$.92^{.338}$
Not experienced violence	176	81.9	164	73.9	340	77.8		183	79.2	139	82.7	322	80.7		
Experienced sexual abuse	19	8.9	8	3.6	27	6.2	$5.39^{.020}$	35	15.2	1	.6	36	9.0	$25.11^{p<.001}$	$2.55^{.110}$
Not experienced sexual abuse	194	91.1	216	96.4	410	93.8		196	84.8	167	99.4	363	91.0		
Parents´ substance abuse: Yes	10	4.7	20	8.8	30	6.8	$3.06^{.080}$	153	67.4	87	53.7	240	61.7	$7.51^{.006}$	$285.98^{p<.001}$
Parents´ substance abuse: No	205	95.3	206	91.2	411	93.2		74	32.6	75	46.3	149	38.3		
Associated variables															
Socio-demographics															
Gender	216	48.9	226	51.1				231	57.9	168	42.1				
Living situation							$1.87^{.600}$							$9.28^{.026}$	$70.05^{p<.001}$
Living with both parents	139	64.4	131	58.7	270	61.5		101	44.9	65	42.5	166	41.6		
Single-parent family	53	24.5	66	29.6	119	26.9		77	34.2	38	24.8	115	28.8		
Living in a stepparent family	18	8.3	21	9.4	39	8.8		9	4.0	15	9.8	24	6.0		
Outside biological family	6	2.8	5	2.2	11	2.5		38	16.9	35	22.9	73	18.3		
Living context							$.09^{.764}$							$.33^{.566}$	$65.43^{p<.001}$
Urban living	103	47.7	111	49.1	214	48.4		173	74.9	130	77.4	96	24.1		
Rural living	113	52.3	115	50.9	228	51.6		58	25.1	38	22.6	303	75.9		

Based on working samples of 442 Sami (NAAHS year 2003-05) and Inuit (WBYG year 2004-05) adolescents, aged 15-16

Inuit adolescents in rural areas had a doubled risk of suicidal thoughts and suicide attempts; however, the association between rural living and suicidal thoughts was significant only in the unadjusted model. Among Sami, rural living showed only a non-significant trend for more suicide attempts in the adjusted model (tables 2 and 3).

Multiple logistic regression analyses by gender and Indigenous group

Shared gender-specific patterns of associations

Females.

As shown in tables 4 and 5, common significant associations occurred for females across Indigenous groups.

Experienced violence was associated with three-times higher odds of reporting suicide attempts for all females, and two- and four-times higher odds of suicidal thoughts for Sami and Inuit females, respectively,

Experienced sexual abuse was associated with reporting more of both types of suicidal behaviour in all females but only in the unadjusted model for suicidal thoughts among Inuit females.

Sami females who reported sexual abuse had eight-times higher odds (large confidence interval) of reporting suicide attempts. Inuit females had doubled odds of reporting suicide attempts when reporting sexual abuse. For Sami females, the odds of reporting suicidal thoughts were nearly 26 times higher when reporting experiences of sexual abuse.

TABLE 2. OR of suicidal thoughts on negative life events and socio-demographic independent variables.

	Sami		*Inuit*	
	Unadjusted OR (95% CI)	*Adjusted OR (95% CI)*	*Unadjusted OR (95% CI)*	*Adjusted OR (95% CI)*
Negative life events				
Not experienced negative life event	1.0 (ref.)			
Experienced violence	2.49 (1.56-3.98)[a]	2.91 (1.71-4.97)[a]	3.09 (1.85-5.16)[a]	3.02 (1.66-5.50)[a]
Experienced sexual abuse	7.85 (2.91-21.17)[a]	7.92 (2.53-24.79)[a]	5.80 (2.64-12.73)[a]	2.37 (1.00-5.61)[c]
Parental substance abuse	1.66 (.77-3.57)	1.64 (.67-3.99)	1.97 (1.27-3.06)[b]	1.40 (.85-2.31)
Female gender	2.82 (1.88-4.22)[a]	3.44 (2.18-5.45)[a]	4.69 (2.92-7.55)[a]	4.23 (2.45-7.28)[a]
Family situation				
Living with both parents	1.0 (ref.)			
Living in a single-parent family	1.28 (.816-2.01)	1.37 (.83-2.26)	1.65 (1.00-2.73)[c]	1.57 (.90-2.73)
Living in a stepparent family	5.34 (2.47-11.53)[a]	5.65 (2.40-13.33)[a]	2.02 (.83-4.88)	2.48 (.85-7.18)
Living outside the biological family	1.13 (.32-3.96)	.44 (.09-2.18)	1.80 (1.01-3.21)[c]	1.93 (.95-3.89)[d]
Rural living	.91 (.62-1.35)	1.12 (.72-1.75)	1.87 (1.16-3.01)[c]	1.44 (.80-2.60)

Based on working samples of 442 Sami (NAAHS year 2003-05) and Inuit (WBYG year 2004-05) adolescents, aged 15-16.
Note: Unadjusted model shows crude/unadjusted OR bivariate associations with no controls. Adjusted model shows adjusted OR with control for negative life events, gender, family situation and living context.
[a] p ≤ .001, [b] p ≤ .01, [c] p ≤ .05, [d] Strong trend p = .07

TABLE 3. OR of suicide attempts on negative life events and socio-demographic independent variables.

	Sami		*Inuit*	
	Unadjusted OR (95% CI)	*Adjusted OR (95% CI)*	*Unadjusted OR (95% CI)*	*Adjusted OR (95% CI)*
Negative life events				
Not experienced negative life event	1.0 (ref.)			
Experienced violence	3.49 (1.88-6.48)[a]	4.25 (2.09-8.65)[a]	3.08 (1.80-5.26)[a]	2.94 (1.59-5.45)[a]
Experienced sexual abuse	9.31 (4.06-21.33)[a]	7.33 (2.90-18.53)[a]	5.70 (2.80-11.63)[a]	2.47 (1.10-5.55)[c]
Parental substance abuse	2.15 (.83-5.59)	1.68 (.52-5.47)	1.75 (1.05-2.91)[c]	1.17 (.66-2.07)
Female gender	2.46 (1.32-4.59)[b]	2.81 (1.36-5.82)[b]	4.87 (2.67-8.86)[a]	4.34 (2.21-8.51)[a]
Family situation				
Living with both parents	1.0 (ref.)			
Living in a single-parent family	.75 (.35-1.59)	.72 (.31-1.66)	1.24 (.70-1.19)	1.05 (.56-1.97)
Living in a stepparent family	2.96 (1.30-6.74)[b]	3.12 (1.20-8.12)[c]	1.03 (.36-2.97)	.99 (.28-3.51)
Living outside the biological family	1.78 (.37-8.63)	.43 (.06-3.19)	1.59 (.84-3.00)	1.21 (.56-2.62)
Rural living	1.28 (.71-2.30)	1.93 (.96-3.88)[d]	2.86 (1.71-4.77)[a]	2.62 (1.40-4.91)[b]

Based on working samples of 442 Sami (NAAHS year 2003-05) and Inuit (WBYG year 2004-05) adolescents, aged 15-16
Note: Unadjusted model shows crude/unadjusted OR bivariate associations with no controls. Adjusted model shows adjusted OR with control for negative life events, gender, family situation and living context.
[a] p ≤ .001 [b] p ≤ .01 [c] p ≤ .05, [d] Strong trend p = .06

Inuit females who reported parental substance abuse had twice the odds of reporting suicidal thoughts and attempts in the unadjusted model only. Sami females had 11-times higher odds (nearly significant) of reporting suicidal thoughts when reporting parental substance abuse.

Sami females living in a stepparent family had seven-times higher odds of reporting suicidal thoughts, and Inuit females had nine-times higher odds (unadjusted model) of suicidal thoughts when living in a stepparent family (tables 4 and 5).

Males.

As shown in tables 4 and 5, common significant associations also occurred also for males across Indigenous groups.

Sami and Inuit males who had experienced violence had more than six- and three-times higher odds of suicide attempts, respectively, and three-times higher odds of reporting suicidal thoughts.

Gender-specific patterns of associations by Indigenous group

Females.

As seen in tables 4 and 5, Inuit females showed a non-significant trend of more suicide attempts when living outside the biological family. Inuit females living in rural areas had two- to three-times higher odds of reporting suicidal thoughts and attempts.

Males.

Among Sami males, experienced sexual abuse was associated with nearly nine-times higher odds of reporting suicide attempts; however, only in the unadjusted model.

Parental substance abuse was associated with more than four-times higher odds of reporting suicide attempts among Sami males in the unadjusted model. Sami males living in a stepparent family had nearly five-times higher odds of reporting suicidal thoughts. Inuit males living outside the biological family had nearly five-times higher odds of reporting suicidal thoughts.

Discussion

This study examined suicidal thoughts and suicide attempts and associated risk factors in Indigenous Sami and Greenlandic adolescents, focusing on both common and group-specific determinants. A particular focus was applied to the impact of negative life events and socio-demographic determinants of suicidal behaviour in Indigenous adolescents in two Scandinavian/Arctic settings. This is the first study of its kind.

Rates of suicidal behaviour are high in this study: one in three Inuit females report suicide attempts, half of Sami and Inuit females report suicidal thoughts, and almost one in three Sami males report having struggled with such thoughts. The rates in our study are higher than some other studies, perhaps because other studies have included a larger age span with older adolescents/young adults, which might give lower rates when asking for suicidal behaviour the last year, but not necessarily lifetime prevalence (23, 50-52).

We found that negative life events were significantly associated with adolescents' suicidal behaviour. The main findings in this study were the associations between suicidal thoughts and/or attempts and violence and sexual abuse.

Across the Indigenous groups, experienced violence and/or sexual abuse were associated with a higher prevalence of suicidal thoughts and suicide attempts, except for a non-significant association between suicidal thoughts and sexual abuse among Inuit. Research shows that Indigenous peoples are more exposed to negative life events in childhood, partly explaining the high rates of suicidal behaviour among Indigenous adolescents (9, 12, 57-62). Some of the health problems that Sami, Inuit, and other Indigenous people contend with originate in the colonisation, discrimination, rapid modernisation and marginalisation of Indigenous identity and culture (1, 2, 63, 64). An example of systemic ethnic discrimination is the continual encroachment on tribal/Indigenous lands, affecting the control and access to labour and material resources (65, 66). Ethnic discrimination can have individual as well as population-level effects, deeply embedded in social systems and structures (63, 65).

Violence

Previous research with American Indian adolescents (67) and Inuit in Quebec (12) support the association we found between violence and suicidal thoughts or suicide attempts, with three- to four-fold higher odds across ethnic groups. This is in line with research with Sami and non-Sami showing that, regardless of ethnicity, respondents who reported childhood violence were three times more likely to suffer from psychological distress (40). The effect of experiencing violence seems to be more important than any difference due to ethnic group. Children who observe domestic violence are more likely to see violence as a normalised coping mechanism for conflict resolution resulting in an increased risk of being a victim or perpetrator of intimate partner violence (68). The negative effects of violence affect children and families across multiple generations (38). Research with Māori adolescents showed that witnessing violence towards a child or adult in the home was associated with a doubled risk of suicide attempts (9).

TABLE 4. Unadjusted and multiple regression analysis predicting suicidal thoughts in Sami and Inuit female and male adolescents

	Sami				*Inuit*			
	Females		*Males*		*Females*		*Males*	
	Unadjusted OR (95% CI)	*Adjusted OR (95% CI)*	*Unadjusted OR (95% CI)*	*Adjusted OR (95% CI)*	*Unadjusted OR (95% CI)*	*Adjusted OR (95% CI)*	*Unadjusted OR (95% CI)*	*Adjusted OR (95% CI)*
Negative life events								
Not experienced negative life event	1.0 (ref.)							
Experienced violence	2.22 (1.070-4.60)[c]	2.39 (1.04-.48)[c]	3.99 (2.05-7.77)[a]	3.66 (1.82-7.35)[a]	4.13 (1.98-8.62)[a]	3.40 (1.55-7.45)[b]	2.38 (.95-5.94)[d]	2.89 (1.03-8.14)[c]
Experienced sexual abuse	20.63 (2.70-157.65)[b]	25.82 (3.11-214.53)[b]	2.83 (.69-11.72)	3.04 (.54-17.06)	3.79 (1.64-8.78)[b]	2.22 (.89-5.56)	.00[f]	.00[f]
Parental substance abuse	9.55 (1.19-76.78)[c]	11.18 (1.17-107.11)[d]	1.06 (.36-3.11)	.84 (.25-2.82)	1.97 (1.12-3.47)[c]	1.69 (.91-3.14)	1.29 (.57-2.92)	.94 (.39-2.29)
Family situation								
Living with both parents	1.0 (ref.)							
Single-parent family	1.45 (.77-2.76)	1.27 (.63-2.54)	1.39 (.70-2.77)	1.25 (.60-2.63)	1.35 (.74-2.46)	1.29 (.67-2.46)	2.62 (.88-7.79)	3.01 (.98-9.28)[d]
Stepparent family	9.97 (2.21-45.03)[b]	7.11 (1.46-34.55)[c]	4.99 (1.83-13.64)[b]	4.62 (1.58-13.56)[b]	8.95 (1.06-75.56)[c]	5.69 (.60-53.69)	2.86 (.71-11.46)	2.25 (.48-10.46)
Outside biological family	1.25 (.24-6.39)	.17 (.02-1.85)	.91 (.10-8.46)	.71 (.07-7.21)	2.01 (.92-4.38)[e]	1.40 (.58-3.40)	2.95 (.98-8.83)[d]	4.74 (1.35-16.68)[c]
Rural/urban living	.94 (.55-1.62)	1.35 (.73-2.48)	.86 (.47-1.56)	.95 (.49-1.86)	2.91 (1.51-5.61)[a]	2.38 (1.13-5.02)[c]	.84 (.32-2.25)	.41 (.12-1.36)

Based on working samples of 442 Sami (NAAHS year 2003-05) and Inuit (WBYG year 2004-05) adolescents, aged 15-16

The unadjusted model shows crude/unadjusted OR, bivariate associations with no controls. The adjusted model shows adjusted OR with control for all independent variables included in the table (negative life events, family situation and living context).

[a] p ≤ .001, [b] p ≤ .01, [c] p ≤ .05, [d] Strong trend p = .06, [e] Strong trend p = .08, [f] Not valid values due to very few respondents in this category

TABLE 5. Unadjusted and multiple regression analysis predicting suicide attempts in Sami and Inuit female and male adolescents

	Sami				*Inuit*			
	Females		*Males*		*Females*		*Males*	
	Unadjusted OR (95% CI)	*Adjusted OR (95% CI)*	*Unadjusted OR (95% CI)*	*Adjusted OR (95% CI)*	*Unadjusted OR (95% CI)*	*Adjusted OR (95% CI)*	*Unadjusted OR (95% CI)*	*Adjusted OR (95% CI)*
Negative life events								
Not experienced negative life event	1.0 (ref.)							
Experienced violence	3.05 (1.35-6.88)[b]	3.30 (1.29-8.41)[c]	6.96 (2.26-21.41)[a]	6.21 (1.88-20.48)[b]	3.09 (1.60-5.95)[a]	2.92 (1.41-6.04)[b]	3.57 (1.16-10-98)[c]	3.64 (1.02-13.01)[c]
Experienced sexual abuse	8.12 (2.98-22.07)[a]	8.44 (2.89-4.65)[a]	8.91 (1.91-41.45)[b]	3.25 (.40-26.32)	3.78 (1.79-7.97)[a]	2.41 (1.05-5.56)[c]	.00[f]	.00[f]
Parental substance abuse	1.28 (.26-6.30)	1.24 (.19-.92)	4.43 (1.26-15.54)[c]	2.14 (.42-10.88)	1.89 (1.01-3.52)[c]	1.53 (.77-3.03)	.74 (.26-2.15)	.54 (.16-1.74)
Family situation								
Living with both parents	1.0 (ref.)							
Single-parent family	.72 (.27.1.90)	.71 (.25-2.04)	.95 (.28-3.28)	.68 (.16-2.90)	.92 (.48-1.78)	.81 (.39-1.64)	2.90 (.76-11.07)	2.91 (.73-11.57)
Stepparent family	2.76 (.93-8.17)[e]	2.60 (.75-.04)	3.87 (1.04-14.41)[c]	4.45 (.93-21.22)[d]	2.27 (.53-9.67)	1.12 (.23-5.57)	1.04 (.11-10.00)	.85 (.08-9.06)
Outside biological family	2.76 (.93-8.17)[e]	.64 (.07-6.02)	.00[f]	.00[f]	2.15 (.99-4.66)[d]	1.36 (.56-3.32)	1.45 (.31-6.90)	1.05 (.18-6.23)
Rural/urban living	1.14 (.55-2.35)	1.48 (.63-3.48)	1.63 (.57-4.67)	2.87 (.79-10.41)	3.52 (1.88-6.61)[a]	2.91 (1.41-6.00)[b]	1.86 (.59-5.83)	1.75 (.43-7.11)

Based on working samples of 442 Sami (NAAHS year 2003-05) and Inuit (WBYG year 2004-05) adolescents, aged 15-16. The unadjusted model shows crude/unadjusted OR, bivariate associations with no controls. The adjusted model shows adjusted OR with control for all independent variables included in the table (negative life events, family situation and living context).
[a] p ≤ .001, [b] p ≤ .01,[c] p ≤ .05,[d] Strong trend p = .06, [e] Strong trend p = .07, [f] Not valid values due to few respondents in this category

Our findings are supported by The Greenlandic Population Survey from 2018 (52), including adolescents and adults, showing that experiencing violence in the childhood home often (vs. never) doubled the odds of later suicidal thoughts.

When looking at suicide attempts in the male group, violence was the only significant variable in the adjusted model. Sami males reported the highest percentage of experienced violence and had the strongest association between violence and suicide attempts, with six times higher odds of reporting suicide attempts versus nearly four times for Inuit males. Due to the effect of violence, the effects of living in a stepparent family and parental substance abuse were ruled out by including violence in the model for suicide attempts among Sami males.

The history of colonisation brought with it changes in ways of living. It has been claimed that Greenlandic women have been more successful than men in adapting to the stress of socio-cultural change, as women continue their traditional roles as caregivers (30). The transition from hunter to wage-earner has been difficult for many Arctic males. The manifestations of stress and suffering are among men somehow more visible as men are more likely to be violent or commit suicide, while we know that females more often report suicide attempts than males (30).

Sexual abuse

The Greenlandic Population Survey from 2018 showed that experiencing sexual abuse in childhood gave three times higher odds of suicidal thoughts later in life (Larsen et al., 2019), with similar findings among American Indian adolescents (Grossman et al., 1991). We found an association between sexual abuse and suicidal behaviour, which was more robust in the Sami group than among the Inuit (seven- vs. two-times higher odds). Curtis, B. (55) also found an association between sexual abuse and suicidal behaviour of both kinds among young Inuit aged 18–25, although non-significant.

In this study, the association between sexual abuse and suicidal behaviour remains strong for females when stratifying by gender but not for males. Sami males had nine times higher odds of reporting suicide attempts when having experienced sexual abuse in the unadjusted model; however, when adjusting for all explanatory variables, violence is the only variable that remains significantly associated with suicide attempts for Sami males. This indicates that violence has a stronger effect on suicidal attempts than sexual abuse among Sami males.

Despite Curtis, Larsen (36) concluding that it is possible to secure reasonably high response rates in surveys including questions on sexual abuse, only one Inuit male reported sexual abuse in this study. Childhood sexual abuse is a sensitive topic, and because this study includes adolescents, closeness in time or living in a situation of abuse might affect them to not wanting or being able to report it. In line with Curtis, Larsen (36), we found that among those adolescents who had experienced violence, twice as many had experienced sexual abuse compared to those who did not report violence (14 % vs. 6 %) across Indigenous groups (unpublished analysis).

Among both Sami and Inuit females, the association between sexual abuse and suicidal behaviour remains significant and does so when including violence in the model, except for suicidal thoughts among Inuit females. Sami females were especially affected by sexual abuse, with eight times higher odds of suicide attempts and 26 times the odds of suicidal thoughts. Perhaps the cultural norm of being strong and/or lack of trust in the helping system make it especially difficult for Sami and Inuit female and male adolescents to cope with the stress of experiencing violence and sexual abuse if it means coping with the difficulties on their own (69).

Parental substance abuse

In this study, parental substance abuse did not significantly affect suicidal behaviour across Indigenous groups in the adjusted model. In the unadjusted model, Inuit adolescents who reported parental substance abuse had twice the odds of reporting suicidal thoughts and attempts.

When stratifying by gender, we found that Sami and Inuit females who reported parental substance abuse had, respectively ten- and two-times higher odds of suicidal thoughts in the unadjusted model; Inuit females had a significant association in the unadjusted model for suicide attempts. Despite a significant association between parental substance abuse and suicidal thoughts among Sami males in the unadjusted model, the results indicate that parental substance abuse has a stronger effect on suicidal behaviour among females than males in this study. Perhaps this gender difference has to do with how females are often socialised into being more family oriented and therefore more affected by alcohol or substance abuse in the home, or the effect of alcohol in the home is connected to a heightened risk of experiencing violence and/or sexual abuse.

Silviken and Kvernmo (50) found that being alcohol intoxicated was associated with suicide attempts for Sami adolescents and thought it might have to do with non-traditional behaviour, as substance abuse is a divergence from traditional cultural norms. The Inuit adolescents in this study were asked, 'Have you experienced misuse of alcohol in your closest family? More than 60 per cent answered yes. Still, as among Sami, alcohol consumption is not traditional in the Indigenous

Inuit culture either, as the colonists brought it to Greenland, and Sápmi. Perhaps the association between alcohol abuse among parents and suicidal behaviour was non-significant because the exposure to violence and sexual abuse was more severe. Even so, Larsen, Hansen (52) found that even when adjusting for violence in the childhood home as well as childhood sexual abuse, alcohol in the childhood home was associated with doubled odds of suicidal thoughts later in life for Greenlandic adolescents and adults. Several studies have found a relationship between misuse of alcohol in the home and sexual abuse (36, 42, 55, 70). In this study, we found that nearly three times as many Inuit females reported sexual abuse when also reporting parental substance abuse (20% vs. 7 %, unpublished analysis).

The vulnerability and exposure to negative life events of this group of Indigenous adolescents must be seen from a historical perspective of generational trauma and oppression, that today is still affecting Inuit and Sami people in complex ways. Historical loss reflects a response to a profound denial of a culture's right to exist and the attempt to eradicate cultural identity (66). The historical losses experienced by Indigenous people started a long time ago, and these experiences have persisted (66).

Hjelmeland and Knizek (2013) discuss how understanding suicidal behaviour as actions of communication has to do with how the suicidal person views him or herself and how they place themselves in their socio-cultural context. To prevent suicide attempts, adolescents who have experienced violence or sexual abuse need help to see how they can affect or change an intolerable situation. Whitbeck, Walls (66) studied the prevalence and correlates (depressive symptoms) of perceived historical loss and suggested that the effects of historical loss may have an early demoralising effect on the development of adolescents.

The fact that the Inuit females in rural areas had higher odds of both suicidal thoughts and attempts, with significant effect even when negative life events are included in the model, shows the importance of geographical disparities on suicidal behaviour. It may be related to the opportunities available and health care in remote areas. The effect of living outside the family for Inuit males, and in a stepparent family for Sami males remains significant even when including negative life events in the model for suicidal thoughts. Growing up outside the home might indicate that the conditions in the home were bad or the death of a parent, both adverse experiences for Inuit males. Previous research has shown an association between living in a stepparent family and higher rates of lifetime suicide attempts among adolescents (71). Our findings indicate that living in a stepparent family is challenging for young Sami males in years of great change and development. Helpers should consider the vulnerability of Indigenous Sami and Inuit males in these living situations.

Clinical implications

Our findings indicate the importance of taking good care of adolescents who are victims of violence and sexual abuse, and schools and primary health care practitioners need to be extra aware of the risk of suicidal behaviour in these adolescents. Our findings highlight the need for culturally-informed preventive programs with a focus on childhood violence and sexual abuse, for Indigenous adolescents in the Arctic. Culturally-informed suicide prevention, however, should involve perspectives of the structures of society, discrimination, and generational trauma, not only focusing on individual risk factors. Reducing the prevalence of violence and sexual abuse on a community level can promote well-being and health among young Sami and Inuit females and males.

Stoor, Eriksen (72) found that most suicide prevention initiatives targeting Sami were focused on individual-relational levels or lack of suicide awareness in the general public. According to the researchers, there is a lack of planning and perspectives, occupational health and safety in reindeer herding, and cultural empowerment among Sami adolescents. Further, the researchers found no prevention rationales that focused on Sami self-determination, historical traumas, Sami exposure to violence (including sexual violence), ethnic discrimination and breaking taboo related to sexuality and gender identity (72)

Njeze, Bird-Naytowhow (73) found three intersecting processes that facilitate resilience and wellness among Indigenous Canadian adolescents: a) a strengthening of cultural identity and family connections, b) engagement in social groups and service to self and community, and c) practices of the arts and a positive outlook.

In research and clinical work settings, ethical awareness is important to contribute to nuanced understandings of developmental pathways, intergenerational effects, and community resilience. Our research aims to contribute to informing policy and practice to better meet the needs of Indigenous individuals, communities, and populations (16).

Strengths and limitations

The gender paradox in suicidology, that more males than women die of suicide while more females attempt suicide, calls for separate analysis for males and females. However, our findings must be interpreted with regard to sample size, as dividing

into genders in the final analyses led to quite small groups.

When variables were constructed, answers were categorised into a smaller number of possibilities. In some cases, the questions had been formulated somewhat differently in the NAAHS and in the WBYG study, which had to be considered when analysing outcomes in the two groups.

Other aspects of Inuit and Sami adolescents' lives can be included in future research on suicidal behaviour, such as social media. Social media was not yet an important component of young people's lives when our study was conducted.

The high response rate and the high number of questions give strength to this study, as do the many included schools and communities, as it was a school-based study. Even though respondent honesty is a potential source of error in all survey methodology, important policy formation often still relies on self-reported data (74). Questionnaires may provide a high response rate and a high degree of honest answers.

We chose to name all the Greenlandic participants Inuit, as we excluded those adolescents with neither Greenlandic identity nor Greenlandic parental affiliation. We believe the two groups are comparable, as some of the Sami adolescents included in this study as Sami only have Sami relatives and do not see themselves as Sami. Ethnicity is complex, and 'categorising' people is challenging as people rarely fit into one particular category. Gone and Kirmayer (16) argue that self-identification by research respondents as Indigenous may be too reductionist to be useful, at least in some research operationalisations and in some national contexts, partly due to many respondents having mixed heritage. We believe that, in the case of our research project, it is still useful and that ethnic identity can be defined in many ways. Almost 50 per cent of Sami respondents in this study answer only 'Norwegian' to the question 'my identity is'. However, only 10 per cent respond 'completely disagree' to the statement 'I consider myself Sami' (unpublished analysis). This demonstrates the complexity of identity.

Conclusion

Results indicate that negative life events, especially violence, are strongly associated with suicidal behaviour among Sami and Greenlandic adolescents, and that the females in these groups with a history of sexual abuse had much higher odds of reporting suicidal behaviour. Although our study does not allow for the inference that the colonisation is the cause of high rates of suicidal behaviour, assimilation and colonisation are a part of the adolescents´ family history and something that might affect the health and well-being of Sami and Inuit males and females still today. RISING SUN, Mihá, and Plan for Suicide Prevention among Sami in Norway, Sweden and Finland (2017) and National Strategy for Suicide Prevention in Greenland 2013–2019 are among projects aimed at preventing suicide and promoting well-being and health among Sami and Inuit adolescents. Our findings highlight the need for such culturally-informed preventive programs, and the focus should be especially on childhood violence and sexual abuse, for Indigenous adolescents in the Arctic.

Ethical approval

This research project has been approved by Regional Committees for Medical Research Ethics – South East Norway on November 30, 2016. Reference number: 2016/1972

Disclosures

No potential conflict of interest was reported by the authors.

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