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# Socio-demographic, psychosocial and environmental factors associated with suicidal behaviour in Indigenous Sami and Greenlandic Inuit adolescents; the WBYG and NAAHS studies

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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.

**Objectives.** The objective was to study associations between suicidal thoughts and suicide attempts and socio-demographic, psychosocial, and environmental factors in Sami and Greenlandic adolescents, within and between groups and gender.

**Methods.** Working samples included 442 Sami and 399 Greenlandic Inuit (15-16-year-olds), in “The Norwegian Arctic Adolescent Health Study” (NAAHS) and “Well-being among Youth in Greenland” (WBYG). Multivariable logistic regression explored associations between suicidal behaviour and family, ethnic language, school, friendship, and suicide in close relations.

**Results.** Across Indigenous groups, suicidal behaviour was associated with the female gender, relationships with parents, suicide of friends, and rural living. Sami adolescents in stepparent families reported more suicidal behaviour. Inuit adolescents living outside the family and with poor school performance reported more suicidal thoughts. Inuit adolescents spending less time with friends reported more attempts. Gender differences occurred in both groups.

**Conclusion.** To Sami and Greenlandic Inuit, family and peer relations are important factors of suicidal behaviour. Prevention programmes should be sensitive to gender and bereavement.

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Studies of Indigenous adolescent populations often show higher rates of suicidal thoughts, suicide attempts, and suicide completion compared to the general population [1–5]. Completed suicide is one of the leading causes of death for young Indigenous people [6,7], with great variations in rates across Indigenous communities [8,9].


Previous suicide attempt(s) is the strongest psychosocial predictor of completed suicide among adolescents [10]. Studies have revealed several correlates associated with suicidal behaviour among Indigenous adolescents, including mental health disorders, stressful life events, and substance abuse [7,11,12]. Additional factors are lack of community support, disadvantaged socioeconomic status, racism, and cultural disagreements with parents [13]. Trying to explain suicidal behaviour in Indigenous people, Silvikén, Haldorsen, and

Kvernmo (2006) hold the importance of cultural factors such as undermining traditional cultural structures and acculturation as a consequence of colonisation and modernisation. This paper aims to study shared and group-specific associations of suicidal behaviour in adolescents in the Sami and Inuit Greenlanders, two Arctic Indigenous populations in Europe.

## *The indigenous Sami and Greenlandic Inuit peoples*

No common and international definition of Indigenous people exists. Article 1b of the ILO Convention concerning Indigenous and Tribal Peoples in Independent Countries (C169, 1989) defines indigenous peoples as “peoples in independent countries who are regarded as indigenous on account of their descent from the

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*populations which inhabited the country, or a geographical region to which the country belongs, at the time of conquest or colonisation or the establishment of present state boundaries and who, irrespective of their legal status, retain some or all of their own social, economic, cultural and political institutions” [14]*

The Sami population is estimated to approx. 80–100,000 inhabitants of northern Scandinavia and the Russian Kola Peninsula, with the majority (approx. 70%) living in Norway (making up about 1% of the Norwegian population) as formally considered Indigenous people with their own culture and native language [15]. Most of the Sami in Norway live in the Arctic part of the country, Sápmi, with the highest density of Sami in the highland of Finnmark. The Sami were originally hunters and fishermen, but today they make their living from semi-nomadic reindeer herding, agriculture, fishing, and modern occupations [16]. 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 [16,17].

Since the 1950’s, the education level of Sami 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 [18]. Despite this development, many Sami people still experience discrimination, particularly those with a strong Sami affiliation [19].

Among the approximately 57,000 inhabitants in Greenland, the native population, Inuit, make up more than 90% of the population [20,21]. In the present paper, the Greenlandic participants will be referred to as Greenlandic and Inuit. Genetically, Greenlanders are Inuit with a mixture of European, mainly Scandinavian genes [22].

In 1721, the Norwegian priest Hans Egede initiated a period during which Greenland became a Danish Christian colony, ending in 1979 when Denmark granted home rule to Greenland [21,22] and Self-Government in 2009 [23].

As the world’s largest island, Greenland has a low population density and limited infrastructure, and demographic challenges [24]. As a society with strong interrelations between the human and natural environments, Greenland has during a short period of time transitioned from subsistence hunting and fishing to an economy

based on wage-earning [24,25]. Greenlandic is the dominant language, but Danish is used in higher education.

### **Suicidal behaviour in Sami and Inuit adolescents**

A variety of studies have investigated suicide and suicidal behaviour (thoughts and attempts) among Sami and Inuit adolescents. Previous analysis of data from The Norwegian Arctic Adolescent Health Study (NAAHS) and Well-being among Youth in Greenland (WBYG) showed that 23% (8% males and 33% females) of Inuit 15 and 16-year-olds and 11% of Sami (6% males and 15% females) 15 and 16-year-olds reported having ever attempted suicide [26]. However, Sami adolescents reported more often to have ever had suicidal thoughts than Inuit adolescents; 28% versus 17%, respectively. Previous analysis of data from WBYG showed even higher rates of suicidal thoughts (52% females and 20% males) and suicide attempts (33% females and 11% males) when including 15 to 18-year olds (N = 508) [27]. When 15 to 19-year old Inuit adolescents were asked about suicide thoughts the last year, 18.1% females and 9.1% males reported suicide thoughts (2005–2010, 20).

The suicide rates among Sami can be considered moderate compared to other Indigenous groups (Silviken et al., 2006). The disparities in mental health indicators between Sami and non-Sami adolescents, in general, are very small or non-existent [28]. However, somewhat higher rates of suicide attempts (non-significant) were found in Sami female adolescents compared to majority peers in The North Norwegian Youth Study [29] and the suicide rates in the general Sami population are slightly higher than in the majority population [30]. In circumpolar regions, suicide among Indigenous adolescents has become a major public health concern, with rates in Greenland among the highest in the world today [2,20,31].

### **Comparing Sami and Inuit adolescents**

Like many other Indigenous populations, the Greenlandic and Sami populations have experienced assimilation and colonisation [26,32,33]. However, although there are 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 [33,34]. However, aspects of economic and cultural colonisation persist

for Inuit people in Greenland [23]. A greater proportion of Inuit people in Greenland speak their Indigenous language compared to 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.

### **Aims of the present study**

This study of Sami and Inuit adolescents aims to increase understanding of suicidal behaviour in Arctic Indigenous adolescents of Scandinavia. Although data were collected over a decade ago, the study questionnaires used in NAAHS and WBYG were developed in close collaboration. Both studies included many participants, providing a unique opportunity to investigate for both shared and ethnic-specific associations of suicidal behaviour in two Scandinavian Indigenous adolescent populations.

First, we aimed to look for shared and non-shared association with suicidal behaviour in the two adolescent Indigenous populations by examining the impact of socio-demographic (gender, family situation, type of community, language competence, psychosocial (school-, family- and peer situation) and environmental factors (suicide in close relations) on suicidal thoughts and suicide attempts in the two Indigenous groups.

Secondly, we aimed to explore gender-specific patterns of associations in each Indigenous group.

## **Materials and method**

### **Sample**

Cross-sectional data from two school-based studies: "The Norwegian Arctic Adolescent Health Study" (NAAHS) and "Well-being among Youth in Greenland" (WBYG), were used. The NAAHS was a study on health and living conditions among all 10<sup>th</sup> graders in the three northernmost counties of Norway. NAAHS was conducted in 2003–2005 among 4,880 students. All 15–16-year-olds (10<sup>th</sup> graders) were invited, and 83% of them participated. All junior high schools (292) in the region, except from 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 proportion in the schools in the Sami-dominated areas of Finnmark. On average, approximately 10% of the sample were Sami (n = 442), an equivalent proportion found in the general population.

The WBYG was a study on well-being, health behaviour, and health among adolescents in Greenland (2004–05). The WBYG 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. Six hundred sixty-three students from 10 schools above the age of 14 in grades 10 and 11 were invited to participate in the WBYG. Five hundred eight students participated (RR of 75%). The selection of schools was based on the desire to represent all of the different geographical areas in Greenland, include adolescents in the villages, and include schools with many students to increase participation [27].

This study examines data of 841 Indigenous adolescents (442 Sami and 399 Inuit) aged 15–16 from the NAAHS and WBYG, respectively (Table 1).

### **Indigenous ethnicity**

In NAAHS, objective ethnicity 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 [35]. The questions had the following options: Norwegian, Sami, Kven, Finnish and Other. Multiple answers were allowed. Sami self-identification was based on the 4-point scale question "I regard myself as Sami ..." with the option Fully or Nearly fully agree and a report of Sami to the question *My ethnicity is?* The participants who regarded themselves as Sami, without reporting Sami objective ethnicity (n = 89), those with only objective ethnicity (n = 121), and those with both subjective and objective Sami ethnicity (n = 232) were included in this study as Sami.

In the WBYG, the objective Inuit ethnicity was registered if the answer was Yes on that either the participant, their mother, or father *was born in Greenland*. The survey asked the questions *Were you born in Greenland? Was your mother born in Greenland? Or Was your father born in Greenland?* Subjective Inuit ethnicity 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 do not know ( $n = 16$ ) unless they reported objective Inuit ethnicity ( $n = 15$ ). In total, 17 people were excluded due to a lack of Inuit affiliation. Inclusion criteria for Indigenous ethnicity (Sami or Inuit) were either Indigenous self-identification, objective ethnicity, or both.

### **Instruments**

The variables from the two datasets were recoded and renamed to make comparable or common variables (Supplementary Table I).

#### **Outcome variables**

**Suicidal behaviour.** In NAAHS, suicidal thoughts were based on the question: *Have you ever thought about taking your own life?* Suicide attempts were based on the question: *Have you ever tried to take your own life?* The options for a reply are Yes or No.

In 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?* The options for a reply are Yes or No for either question.

#### **Explanatory variables**

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

**Family situation.** The NAAHS and WBYG participants were asked *Who do you live with at the moment?* Options for NAAHS were: Mother and father, Only mother, Only father, Equally with mother and with father, mother or father with a new partner, Foster parents, or Others and for WBYG: 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 = Mother/adoptive mother or father/adoptive father or equally with mother and with father, 3 = Mother with a new partner or father with a new partner and 4 = Living outside the biological family.

**Rural/urban living.** NAAHS: Urban living: the participant's school is located 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 ten years old? In a town in Greenland, in a village in Greenland or not in Greenland?* with the following options: In a town in Greenland, in a village in Greenland, or not in Greenland. Urban living: In a town in Greenland or Not in Greenland, and Rural living: In a village.

**Indigenous language competence.** NAAHS: participants were considered to have Indigenous language competence if they reported Sami on either *What language did you learn at home* or *What is your primary language in school?* Options were Norwegian, Sami, Kven/Finnish, Another language.

WBYG: participants who answered Well or Very well to the question *How well do you speak Greenlandic?* (remaining options: With difficulty or Not at all) were considered to have Indigenous language competence.

NAAHS/WBYG: No Indigenous language competence or Indigenous language competence.

**Spend time with friends.** In NAAHS, participants were asked *Approximately how many times per week do you spend time with them (close friends) out of school?* The options are: Less than one time, 1 or 2 times, three or more times. Three or more times was considered often.

In the WBYG, participants were asked, *How often do you spend time with classmates or friends after school hours?* 2–3 days per week or more was considered often. Two categories were made: Rarely spend time with friends (Between zero and two times a week) or Often spend time with friends (Between three times a week and every day).

**Well-being in school.** NAAHS: measured by the question *Do you enjoy going to school?* The following options were possible: Fully agree, Partly agree, Partly disagree, Fully disagree. Fully or partly agree were coded as Well, while partly or fully disagree were coded as Not so well.

WBYG: measured by the question *Do you like going to school?* The following options were possible: Very well, Well, Fair, Not so well. Very well and well were coded as Well, while fair and not so well were coded as Not so well.

**School performance.** NAAHS: measured by the question *What were your last grades in maths, Norwegian writing, English, and social science?* There are options from 1–6, where six is the best. An average of 4, 5, or 6 was coded as Good, while an average of 1, 2, or 3 was coded as Not so good.

WBYG: measured by the question *How do you think you are doing in school regarding subjects?* The

**Table 1.**

Baseline characteristic	Sami (NAAHS <sup>d</sup> )		Inuit (WBYG <sup>e</sup> )	
	N	(%)	N	(%)
Study year	2003–05		2004–05	
Invited (n) <sup>a</sup>	5877		663	
Participants (n)	4880		508	
Response rate (%)		(83)		(75)
Number of participating schools (n)	292 <sup>b</sup>		10	
Working sample of 15–16-year old Indigenous participants <sup>c</sup>	442	(52.6)	399	(47.4)
Males (n)	226	(51.1)	168	(42.1)
Females (n)	216	(48.9)	231	(57.9)

<sup>a</sup>Including both indigenous Sami and Greenlandic Inuit, but also Norwegian and Danish adolescents.

<sup>b</sup>At 116 junior high schools one or more students reported Sami origin.

<sup>c</sup>NAAHS: 10th graders; WBYG: 10th and 11th graders

<sup>d</sup>The Norwegian Arctic Adolescent Health Study

<sup>e</sup>Well Being Among Youth in Greenland

following options were possible: Very good, Good, Fair, Not so good. Very good or good were coded as Good, while fair and not so good were coded as Not so good.

**Adolescent-parent relationship.** NAAHS: measured by the question *If you have personal problems, to whom could you go?* Where parents were one of the alternatives with options Yes, No, or I do not know. WBYG: *How easy or difficult is it for you to talk to the following persons when you have problems?* Parents were one of the alternatives with options Very easy, Easy, Difficult, Very difficult, or I do not have (parents). The alternative “I do not have any parents” was categorised as missing. NAAHS/WBYG: participants were considered to have a good relationship to parents if they answered Yes in NAAHS and Very easy or Easy in WBYG, and a poor relationship when answering No or I do not know” in NAAHS and Difficult or Very difficult in WBYG.

**Suicide in close relations.** NAAHS/WBYG: participants were asked *Do you know someone who died by suicide?* with the options No or Yes. Further, participants who answered Yes were asked who this person was. NAAHS: *If yes, was it ... ?* with the following options: Close family, Relative, Friend, Fellow student. WBYG: *If yes, was it ... ?* with the following options: Family, Girlfriend/boyfriend/good friend, A pal. NAAHS/WBYG: three separate variables were made: 1. Suicide in the family, 2. The suicide of a friend (or girlfriend/boyfriend) and 3. Suicide by others with Yes or No.

## Statistical analysis

Chi-square tests were used for bivariate analyses of outcome and explanatory variables stratified by ethnic groups and in the total sample to analyze ethnic differences (Table 2).

Logistic regression was carried out in the total sample separately for suicidal thoughts and suicide attempts, both unadjusted and adjusted (Supplementary Table 2). In the adjusted model, interactions between ethnicity and each of the explanatory variables were investigated. Only variables with a significant effect in the unadjusted univariate analyses or adjusted analyses were included in the block-wise multiple logistic regression analyses; ten variables for suicidal thoughts and twelve variables for suicide attempts, respectively (Supplementary Table 2).

In the multivariable analyses, variables were included in 4 blocks: block 1) Socio-demographics, block 2) School, block 3) Family and friends, and block 4) Suicide in close relations, separately for suicidal thoughts (Table 3) and suicide attempts. Included in Table 3 and Table 4 are also univariate logistic regression for each ethnic group, separately for each suicidal behaviour and explanatory variables, in order to follow changes in associations from the unadjusted univariate to the adjusted multivariate analysis.

Finally, separate gender – and ethnically stratified analyses were carried out using the same block-wise model as for the whole group as described above. Only the last and fourth block is presented for females and males separately (Table 5–VI). All analyses were conducted with IBM SPSS 26. The level of significance was set to  $p \leq 0.05$ .

## Results

### *Distribution of socio-demographic, psychosocial, and environmental associations by Indigenous group and gender*

Significant Sami-Inuit group differences occurred for most associations (Table 2).

**Table 2.** Distribution of outcome and explanatory variables of Norwegian Sami and Greenlandic Inuit adolescents by ethnicity and gender.

Variable	Sami				Inuit				Sami vs. Inuit Effect of $\chi^2$ ethnicity <sup>a</sup>
	N	Female (%)	Male (%)	Total (%)	N	Female (%)	Male (%)	Total (%)	
Outcome variable									
Suicidal behaviour									
Suicidal thoughts	108	(50.7)	58	(26.7)	166	(38.6)	29	(18.5)	43.73***
Suicide attempt(s)	35	(16.4)	16	(7.4)	51	(11.9)	15	(9.3)	30.28***
Explanatory variable									
Socio-demographic									
Family situation									
Living with both parents	139	(64.4)	131	(58.7)	270	(61.5)	60	(35.7)	9.06*
Living in a single-parent home	53	(24.5)	66	(29.6)	119	(27.1)	31	(18.5)	
Living in a stepparent family	18	(8.3)	21	(9.4)	39	(8.9)	6	(3.6)	
Living outside the biological family	6	(2.8)	5	(2.2)	11	(2.5)	71	(42.3)	
Type of community									
Urban	103	(47.7)	111	(49.1)	214	(48.4)	173	(74.9)	.33 <sup>ns</sup>
Rural	113	(52.3)	115	(50.9)	228	(51.6)	58	(25.1)	3.57 <sup>ns</sup>
Indigenous language competence									
Yes	56	(25.9)	50	(22.1)	106	(24.0)	155	(92.3)	
No	160	(74.1)	176	(77.9)	336	(76.0)	13	(7.7)	42.628***
Psychosocial									
School									
Well-being in school									
Good	196	(90.7)	197	(87.6)	393	(89.1)	125	(75.3)	.17 <sup>ns</sup>
Poor	20	(9.3)	28	(12.4)	48	(10.9)	41	(24.7)	24.86***
School performance									
Not so good	17	(9.1)	41	(20.3)	58	(14.9)	68	(40.7)	.24 <sup>ns</sup>
Good	169	(90.9)	161	(79.7)	330	(85.1)	99	(59.3)	71.20***
Friends, family									
Spend time with friends									
Never/Rarely	65	(30.2)	52	(23.6)	117	(26.9)	15	(9.1)	10.92**
Often	150	(69.8)	168	(76.4)	318	(73.1)	150	(78.4)	13.07***
Adolescent-parents relationship									
Good	111	(52.1)	118	(56.5)	229	(54.3)	113	(71.5)	.65 <sup>ns</sup>
Poor	102	(47.9)	91	(43.5)	193	(45.7)	45	(28.5)	19.20***
Environmental									
Suicide in close relations									
Yes	82	(38.5)	74	(34.6)	156	(36.5)	129	(80.1)	.07 <sup>ns</sup>
No	131	(61.5)	140	(65.4)	271	(63.5)	32	(19.9)	151.68***
Who died from suicide									
Suicide in the family	28	(18.1)	41	(13.0)	69	(15.6)	55	(32.7)	.06 <sup>ns</sup>
Suicide of friend	19	(8.8)	29	(12.8)	48	(10.9)	66	(39.3)	.06 <sup>ns</sup>
Suicide of another person	49	(22.7)	37	(16.4)	86	(19.5)	68	(40.5)	0.56 <sup>ns</sup>

Note: Statistical analyses: Chi-square test ( $\chi^2$ ): \*p < .05. \*\*p < .01. \*\*\*p < .00. <sup>ns</sup> Non-significant. <sup>a</sup>Sami vs. Inuit

**Table 3.** A hierarchical multiple regression analysis predicting suicidal thoughts in Sami and Inuit adolescents.

Suicidal thoughts	Sami						Inuit					
	Unadjusted <sup>a</sup>			Adjusted <sup>b</sup>			Unadjusted <sup>a</sup>			Adjusted <sup>b</sup>		
	OR	CI (95%)	p	OR	CI (95%)	p	OR	CI (95%)	p	OR	CI (95%)	p
Socio-demographic												
Gender												
Male	1.0			1.0			1.0			1.0		
Female	<b>2.82</b>	<b>(1.88–4.22)</b>	<b>.000</b>	<b>3.52</b>	<b>(2.14–5.77)</b>	<b>.000</b>	<b>4.69</b>	<b>(2.92–7.55)</b>	<b>.000</b>	<b>6.20</b>	<b>(3.50–11.01)</b>	<b>.000</b>
Family situation												
Living with both parents	1.0			1.0			1.0			1.0		
Living in a single-parent home	1.28	(.82–2.01)	.282	1.04	(.61–1.78)	.889	<b>1.81</b>	<b>(1.03–3.20)</b>	<b>.039</b>	1.73	(.88–3.40)	.114
Living in a stepparent family	<b>5.34</b>	<b>(2.47–11.53)</b>	<b>.000</b>	<b>6.38</b>	<b>(2.51–16.19)</b>	<b>.000</b>	1.96	(.82–4.66)	.131	1.69	(.64–4.47)	.288
Living outside the biological family	1.13	(.32–3.96)	.849	.59	(.13–2.81)	.510	<b>1.96</b>	<b>(1.19–3.22)</b>	<b>.008</b>	<b>2.42</b>	<b>(1.25–4.69)</b>	<b>.009</b>
Type of community												
Urban living	1.0			1.0			1.0			1.0		
Rural living	.91	(.62–1.35)	.646	1.09	(.68–1.74)	.729	<b>1.87</b>	<b>(1.16–3.01)</b>	<b>.010</b>	1.01	(.52–1.96)	.976
Indigenous language competence												
Yes	1.0			1.0			1.0			1.0		
No	<b>1.71</b>	<b>(1.05–2.77)</b>	<b>.031</b>				.88	(.34–2.25)	.782			
Psychosocial												
Well-being in school												
Good	1.0			1.0			1.0			1.0		
Poor	<b>2.04</b>	<b>(1.10–3.78)</b>	<b>.023</b>	<b>2.25</b>	<b>(.99–5.09)</b>	<b>.055</b>	<b>1.83</b>	<b>(1.13–2.96)</b>	<b>.015</b>	1.49	(.80–2.77)	.201
School performance												
Good	1.0			1.0			1.0			1.0		
Poor	.90	(.49–1.65)	.736	.90	(.43–1.88)	.774	2.79	<b>(1.82–4.29)</b>	<b>.000</b>	<b>2.23</b>	<b>(1.27–3.91)</b>	<b>.005</b>
Friends, family												
Spend time with friends												
Much	1.0			1.0			1.0			1.0		
Little	1.19	(.77–1.84)	.447				1.68	(.97–2.92)	.063			
Adolescent-parent relationship												
Good	1.0			1.0			1.0			1.0		
Poor	<b>2.07</b>	<b>(1.39–3.10)</b>	<b>.000</b>	<b>1.83</b>	<b>(1.14–2.94)</b>	<b>.013</b>	<b>2.60</b>	<b>(1.63–4.14)</b>	<b>.000</b>	<b>2.26</b>	<b>(1.30–3.93)</b>	<b>.004</b>
Environmental												
Suicide in close relations												
No	1.0			1.0			1.0			1.0		
Suicide in the family	1.62	(.96–2.73)	.069	1.62	(.87–2.98)	.129	1.37	(.89–2.12)	.150	1.39	(.81–2.39)	.233
Suicide of friend	<b>2.62</b>	<b>(1.41–4.86)</b>	<b>.002</b>	<b>2.55</b>	<b>(1.16–5.60)</b>	<b>.020</b>	<b>2.35</b>	<b>(1.54–3.59)</b>	<b>.000</b>	<b>2.30</b>	<b>(1.37–3.87)</b>	<b>.002</b>
Suicide of another person	1.50	(.93–2.42)	.093				.79	(.52–1.21)	.282			

<sup>a</sup>Univariate logistic regression<sup>b</sup>Note: Final block – all variable adjusted for each other



**Table 4.** A hierarchical multiple regression analysis predicting suicide attempts in Sami and Inuit adolescents.

Variables	Sami						Inuit					
	Unadjusted <sup>a</sup>			Adjusted <sup>b</sup>			Unadjusted <sup>a</sup>			Adjusted <sup>b</sup>		
	OR	CI (95%)	p	OR	CI (95%)	p	OR	CI (95%)	p	OR	CI (95%)	p
Socio-demographic												
Gender												
Male	1.0			1.0			1.0			1.0		
Female	<b>2.46</b>	<b>(1.32–4.59)</b>	<b>.005</b>	<b>3.32</b>	<b>(1.50–7.38)</b>	<b>.003</b>	<b>4.87</b>	<b>(2.67–8.86)</b>	<b>.000</b>	<b>5.49</b>	<b>(2.64–11.44)</b>	<b>.000</b>
Family situation												
Living with both parents	1.0			1.0			1.0			1.0		
Living in a single-parent home	.75	(.35–1.59)	.450	.54	(.20–1.46)	.225	1.48	(.78–2.81)	.228	1.11	(.49–2.51)	.803
Living in a stepparent family	<b>2.96</b>	<b>(1.30–6.74)</b>	<b>.010</b>	<b>3.37</b>	<b>(1.22–9.28)</b>	<b>.019</b>	1.03	(.36–2.97)	.961	.88	(.27–2.85)	.836
Living outside the biological family	1.78	(.37–8.63)	.475	1.05	(.16–6.94)	.963	1.44	(.82–2.53)	.208	1.19	(.55–2.57)	.660
Type of community												
Urban	1.0			1.0			1.0			1.0		
Rural	1.28	(.71–2.30)	.416	<b>2.72</b>	<b>(1.23–6.01)</b>	<b>.014</b>	<b>2.86</b>	<b>(1.71–4.77)</b>	<b>.000</b>	<b>2.53</b>	<b>(1.22–5.25)</b>	<b>.012</b>
Indigenous language competence												
Yes	1.0			1.0			1.0			1.0		
No	1.28	(.62–2.66)	.506	2.51	(.93–6.80)	.070	.81	(.27–2.50)	.719	1.52	(.40–5.91)	.543
Psychosocial												
Well-being in school												
Good	1.0			1.0			1.0			1.0		
Poor	1.97	(.89–4.36)	.095	2.02	(.66–6.22)	.221	<b>1.71</b>	<b>(1.00–2.92)</b>	<b>.049</b>	1.30	(.65–2.62)	.462
School performance												
Good	1.0			1.0			1.0			1.0		
Poor	1.04	(.42–2.62)	.928	1.12	(.35–3.57)	.845	<b>2.60</b>	<b>(1.59–4.24)</b>	<b>.000</b>	1.91	(.97–3.73)	.060
Friends family												
Spend time with friends												
Much	1.0			1.0			1.0			1.0		
Little	.93	(.48–1.81)	.827	.67	(.28–1.52)	.315	2.55	(1.43–4.55)	.002	<b>2.55</b>	<b>(1.25–5.21)</b>	<b>.010</b>
Adolescent-parent relationship												
Good	1.0			1.0			1.0			1.0		
Poor	<b>3.14</b>	<b>(1.65–5.95)</b>	<b>.000</b>	<b>3.13</b>	<b>(1.45–6.79)</b>	<b>.004</b>	<b>2.38</b>	<b>(1.40–4.03)</b>	<b>.001</b>	<b>2.13</b>	<b>(1.12–4.08)</b>	<b>.022</b>
Environmental Suicide in close relations												
No	1.0			1.0			1.0			1.0		
Suicide in the family	1.58	(.77–3.27)	.216	2.18	(.91–5.24)	.083	<b>1.67</b>	<b>(1.03–2.72)</b>	<b>.038</b>	1.23	(.65–2.32)	.814
Suicide of friend	<b>5.30</b>	<b>(2.64–10.67)</b>	<b>.000</b>	<b>5.81</b>	<b>(2.22–15.22)</b>	<b>.000</b>	<b>3.33</b>	<b>(2.04–5.43)</b>	<b>.000</b>	<b>3.41</b>	<b>(1.86–6.23)</b>	<b>.000</b>
Suicide of another person	<b>2.24</b>	<b>(1.18–4.24)</b>	<b>.013</b>				.80	(.49–1.30)	.366			

<sup>a</sup>Univariate logistic regression<sup>b</sup>Final block – all variable adjusted for each other

### ***Socio-demographic correlates***

Overall, twice as many Sami reported rural living, and nearly 25% more Sami reported living with both parents compared with Inuit. Fourteen times more Inuit live outside the biological family, and four times as many Inuit spoke their Indigenous language compared to Sami.

### ***Psychosocial associations***

Inuit adolescents spent more time with friends compared to Sami. More Sami adolescents than Inuit counterparts reported poor relationships with parents, while Inuit adolescents experienced less well-being in school and poorer school performance compared to Sami peers.

Significant gender differences within the Indigenous groups occurred only for a few of the variables: Inuit females spent less time with friends compared with Inuit boys. Sami males reported poorer school performance than Sami females (Table 2).

### ***Environmental associations***

Suicide in close relations was reported by twice as many Inuit compared to Sami, as was a suicide in the family and suicide by another more distant person. The suicide of a friend was four times as common in the Inuit group compared to the Sami group (Table 2).

### ***Prevalence of suicidal behaviour by Indigenous group and gender***

#### ***Both ethnic groups combined***

Across the Indigenous groups, suicidal thoughts were reported by nearly 40% and suicide attempts by nearly 18% (Table 2). Twice as many Inuit females had attempted suicide compared to Sami counterparts (16% vs. 33%), while among males, the rate was nearly similar (7% vs. 9%). Within both Indigenous groups, females reported more suicidal thoughts and suicide attempts than males (Table 2). Sami males reported suicidal thoughts more often than Inuit males.

### ***Multiple logistic regression analyses: socio-demographic, psychosocial, and environmental associations with suicidal behaviour by Indigenous group***

Table 3 and IV shows the unadjusted variables and the fourth and final block of the multivariate model for suicidal thoughts and attempts, where all included variables are adjusted for each other.

#### ***Shared associations***

Overall, females had higher odds of reporting suicidal thoughts and attempts: for Sami females, more than three times higher, and for Inuit, females were five to six

times higher than their male counterparts (Table 3 and IV). Adolescents living in rural areas had more than twice the odds of reporting suicide attempts compared to peers in urban settings. A poor relationship to parents increased the odds of suicidal behaviour in both Indigenous groups. Across the two Indigenous groups, the suicide of a friend was associated with a considerable increase in odds of both types of suicidal behaviour (Table 3 and IV).

### ***Indigenous group-specific associations***

For both Indigenous groups, the family situation influenced suicidal behaviour, but in different ways. Six times higher odds for Sami adolescents who lived in a stepparent family of reporting suicidal thoughts and more than three times higher odds of suicide attempts. Inuit adolescents living outside the biological family, had twice the odds of reporting suicidal thoughts (Table 3 and IV).

Among Sami adolescents, there was a strong trend ( $p = .07$ ) of more suicide attempts in adolescents not speaking the Sami language (Table 3).

Inuit adolescents who reported poor school performance and spending less time with friends had more than twice the odds of reporting suicidal thoughts and suicide attempts, respectively (Table 3 and IV).

### ***Multiple logistic regression analyses by gender and Indigenous group***

#### ***Shared gender-specific patterns of associations***

As shown in Table 5, two common significant associations occurred for females across the Indigenous groups. Among Sami and Inuit females, a poor relationship with parents was associated with more than twice the odds of reporting suicidal thoughts and suicide attempts (nearly significant). The suicide of a friend was associated with more suicidal behaviour in both groups as Sami females reported more than six and five times more of both types of suicidal behaviour, and Inuit females had nearly two- and four times higher odds of reporting suicidal thoughts and suicide attempts, respectively.

The only common significant determinant in males across the two Indigenous groups was the suicide of a friend, but for different suicidal behaviours: Sami males had four times higher odds of reporting suicide attempts, while Inuit males reporting suicide of a friend had eight times higher odds of suicidal thoughts (Table 6).

#### ***Gender-specific patterns of associations by Indigenous group***

Across gender, living in a stepparent family was strongly associated with suicidal behaviour in Sami

**Table 5.** Suicide thoughts and attempt in Sami and Inuit females – Hierarchical multiple regression (final block – all variable adjusted for each other).

Variable	Suicide thoughts						Suicide attempt					
	Sami female			Inuit females			Sami females			Inuit females		
	OR	CI (95%)	P	OR	CI (95%)	P	OR	CI (95%)	P	OR	CI (95%)	P
Socio-demographic												
Family situation												
Living with both parents	1.0		.803	1.0		.095	1.0		.482	1.0		.984
Living in a single-parent home	1.10	(.52–2.34)	<b>.015</b>	2.00	(.89–4.52)	.411	.65	(.19–2.19)	.147	.99	(.39–2.54)	.777
Living in a stepparent family	<b>13.83</b>	<b>(1.67–114.47)</b>	.987	1.60	(.52–4.91)	<b>.022</b>	2.72	(.70–10.52)	.533	.83	(.22–3.12)	.587
Living outside the biological family	.98	(.12–7.78)	.546	<b>2.66</b>	<b>(1.15–6.13)</b>	.316	2.02	(.79–5.45)	.140	1.28	(.52–3.14)	.011
Type of community												
Urban	1.0			1.0			1.0			1.0		
Rural	.82	(.43–1.56)		1.54	(.66–3.59)		2.07	(.79–5.45)		<b>3.04</b>	<b>(1.29–7.19)</b>	
Indigenous language competence (only suicide attempts)												
Yes												
No							1.0		.186	1.76	(.31–9.90)	.521
Psychosocial												
Well-being in school												
Good	1.0		.296	1.0		.259	1.0		.415	1.0		.783
Poor	2.04	(.54–7.76)		1.57	(.72–3.46)		1.88	(.41–8.59)		.89	(.38–2.06)	
School performance												
Good	1.0		.869	1.0		<b>.001</b>	1.0		.302	1.0		<b>.035</b>
Poor	1.11	(.32–3.84)		<b>3.04</b>	<b>(1.53–6.04)</b>		2.13	(.51–8.91)		<b>2.30</b>	<b>(1.06–5.00)</b>	
Friends, family												
Spend time with friends (only suicide attempts)												
Much												
Little							1.0		.189	1.0		<b>.041</b>
Adolescent–parent relationship							.48	(.16–1.44)		<b>2.37</b>	<b>(1.04–5.40)</b>	
Good	1.0		.014	1.0		<b>.011</b>	1.0		.056	1.0		.055
Poor	<b>2.30</b>	<b>(1.18–4.48)</b>		<b>2.50</b>	<b>(1.23–5.05)</b>		2.55	(.98–6.67)		2.09	(.98–4.45)	
Environmental												
Suicide in close relations												
No	1.0		.198	1.0		.415	1.0		.552	1.0		.584
Suicide in the family	1.86	(.72–4.77)		1.33	(.67–2.60)		1.44	(.43–4.77)		1.23	(.59–2.58)	
Suicide of friend	<b>6.72</b>	<b>(1.33–34.07)</b>	<b>.021</b>	<b>1.91</b>	<b>(1.00–3.63)</b>	<b>.050</b>	<b>5.46</b>	<b>(1.44–20.71)</b>	<b>.013</b>	<b>4.13</b>	<b>(2.06–8.28)</b>	<b>.000</b>

**Table 6.** Suicide thoughts and attempt in Sami and Inuit males – Hierarchical multiple regression (final block – all variable adjusted for each other).

Variable	Suicide thoughts						Suicide attempt					
	Sami males			Inuit males			Sami males			Inuit males		
	OR	CI (95%)	p	OR	CI (95%)	p	OR	CI (95%)	p	OR	CI (95%)	p
<b>Sociodemographic</b>												
Family situation												
Living with both parents	1.0		.987	1.0		.552	1.0		.303	1.0		.283
Living in a single parent home	.99	(.44–2.23)	<b>.009</b>	1.51	(.39–5.83)	.364	.36	(.05–2.54)	<b>.018</b>	2.83	(.42–18.92)	.631
Living in a stepparent family	<b>4.45</b>	<b>(1.46–13.54)</b>	.999	2.58	(.33–19–97)	.219	<b>9.99</b>	<b>(1.47–67.81)</b>	.999	1.97	(.12–31.33)	.860
Living outside the biological family	.00	(.00–)		2.03	(.66–6.26)		.000	(.000–)		1.16	(.22–6.29)	
Type of community												
Rural	1.0		.897	1.0		.163	1.0		<b>.023</b>	1.0		.293
Urban	.95	(.47–1.95)		.40	(.11–1.45)		<b>7.18</b>	<b>(1.31–39.37)</b>	.213	2.45	(.46–13.05)	.505
Indigenous language competence (ref: “yes” = 1) (only suicide attempts)							3.16	(.52–19.24)		2.21	(.22–22.75)	
<b>Psychosocial</b>												
School												
Well-being in school												
Good	1.0		.112	1.0		.427	1.0		.156	1.0		.062
Poor	2.39	(.82–6.99)		1.58	(.51–4.93)		4.87	(.55–43.44)		4.65	(.93–23.39)	
School performance												
Good	1.0		.664	1.0		.819	1.0		.340	1.0		.538
Poor	.83	(.32–2.07)		1.13	(.39–3.31)		.29	(.023–3.67)		.58	(.11–3.24)	
Friends, family												
Spend time with friends (only suicide attempts)												
Much												
Little												
Adolescent–parent relationship												
Good	1.0		.335	1.0		.149	2.62	(.49–13.89)	.259	5.67	(.98–32.71)	.052
Poor	1.42	(.70–2.91)		2.08	(.77–5.61)		1.0		<b>.041</b>	1.0		.293
Environmental												
Suicide in close relations												
No	1.0		.306	1.0		.217	1.0		.065	1.0		.624
Suicide in the family	1.56	(.67–3.65)		1.83	(.70–4.80)		3.97	(.92–17.20)		1.41	(.46–5.53)	.142
Suicide of friend	1.77	(.63–4.95)		<b>4.06</b>	<b>(1.51–10.91)</b>	<b>.005</b>	<b>8.13</b>	<b>(1.74–37.97)</b>	<b>.008</b>	2.90	(.70–12.00)	

adolescents, particularly for suicidal thoughts in females and suicide attempts in males. For Inuit females living outside the biological family, the odds of suicidal thoughts were doubled. Inuit females and Sami males living in rural communities seemed to be at higher risk of reporting suicide attempts (Table 5 and VI).

In the gender-specific analysis, poor school performance influenced Inuit females with two-three times higher odds of reporting suicidal thoughts and attempts. For Inuit males, this association was nearly significant in the same direction ( $p = .062$ ). Regarding spending little time with friends, the same pattern occurred for the Inuit group. This association was significant in females indicating higher odds of suicidal attempts and close to significant for males ( $p = .052$ ) (Table 5 and VI).

A poor relationship to parents occurred significantly or showed a strong trend for suicidal behaviour for both genders across Indigenous groups except for Inuit males. In particular, Sami males reporting a poor relationship with parents had five times higher odds of reporting suicide attempts (Table 5 and VI).

Despite being a strong trend in the whole Sami group, Indigenous language competence did not influence suicidal behaviour in the gender-stratified analysis in either Indigenous group.

## Discussion

This study examined suicidal thoughts and suicide attempts and associated factors in Indigenous Sami and Greenlandic adolescents, focusing on common and group-specific determinants. With a particular focus on the impact of socio-demographic, psychosocial, and environmental determinants of suicidal behaviour in Indigenous adolescents in two European and Arctic contexts, it is the first study of its kind. We found that psychosocial and environmental determinants played an important role in the adolescents' suicidal behaviour: family and friend relations in particular. The main findings in this study were the associations between suicidal thoughts and attempts and female gender, suicide by a friend, relationship to parents, family situation, and rural living.

Suicidal behaviour, such as suicide attempts and suicide, are greater problems in Greenland than among Sami and correlates with the higher rates of completed suicides in young people in Greenland compared to Sápmi [20,30]. In the current study, twice as many Inuit adolescents reported suicide attempts compared to Sami peers.

## Shared associations

### Female suicidal behaviour

The high rates of suicidal behaviour in females in both Indigenous groups correspond with other studies of Indigenous and non-Indigenous peoples [30,36–41]. The reason for this gender difference is complex [36]. It might be related to females reporting a higher occurrence of affective disorders and a higher and perhaps genetically caused vulnerability in women. While males perhaps act out, females tend to reflect before communicating in an attempt to regulate feelings and behaviours. These differences may be what makes females more at risk of suicidal thoughts and attempts [40].

### Suicide of friends

We found that the odds of reporting suicidal thoughts and suicide attempts were higher among Sami and Inuit adolescents reporting suicide among friends, a finding that is supported by previous analysis from WBYG [27] and studies among Indigenous Māori adolescents in New Zealand and Native American adolescents in the US [42–44]. Higher rates of suicides in Greenland compared to Sápmi are possibly mirrored in the higher rates of suicidal behaviour. They may explain the variation found in suicide attempts between Sami and Inuit adolescents in this study. Robinson, Too [42] found that suicides by young people were more likely to occur as part of a cluster compared to adults and that suicides by Indigenous Australian adolescents were also more likely to occur in clusters compared to non-Indigenous adolescents. Similarly, clustering of suicides has been found among Sami young and adult males, especially [45].

Abrutyn and Mueller [46] found that the suicide attempts of role models – primarily friends – were associated with more suicidal behaviour. Social relationships that are supposed to protect against suicide instead “teach” the adolescent that suicidal behaviour is a way to deal with distressing life events, suggesting mechanisms such as social learning, imitation, and emotional contagion [46]. This factor may also be the case for Sami and Inuit adolescents in our study.

Females seemed to be more strongly affected by suicide among friends than males, and particularly Sami females. Abrutyn and Mueller [46] found that the impact of the suicide of a friend lasts at least for one year. While the effect faded in time among males, female adolescents were still affected six years later. Female adolescents are more vulnerable to suicide suggestions than males, and the gender difference might be explained by males having relationships that are far less emotionally anchored [46].

### ***Adolescent-parent relationship***

In this case, the impact of the relationship to parents and feeling able to talk to parents about problems is supported by previous research [13]. Adolescents are profoundly affected by and connected to their parents [47]. Swedo, Rettew [48] compared adolescents in groups of suicide attempters, those with known risk factors, and a control group. They found that family support, interpersonal relationships (particularly between the attempter and his or her parents), and communication patterns were some of the areas in which suicide attempters differed significantly from the control group. A study by Clark, Robinson [44] demonstrated that family connection was associated with less reporting of suicide attempts for Indigenous Māori youth. Based on these findings, we argue that the Western approach to prevention focusing on the individual is not adequate in an Indigenous context when problems exist between family members. Helpers need to know the community, the culture and how the roles and structure in an Indigenous family can cause both risk and protection against adolescents' suicidal behaviour. Research by Silvikien and Kvernmo [49] and previous analysis of data from NAAHS [12,49] show that Sami adolescents' suicide attempts were associated with adversities connected to family, such as divorce, living in a single-parent home, paternal over-protection, or parental mental problems, all of which can influence the adolescents' relationship to their parents as well as being seen as culturally divergent as the family structures are central in a Sami context.

### ***Rural living***

Like Bolliger and Gulis [50], holding geographical disadvantage as one of the predictors of suicide among Greenlandic adolescents, we found that living in a rural community was associated with higher odds of reporting suicide attempts among Sami males and Inuit females. Previous research supports and differs from our findings [39,47]. The gender difference in the two Indigenous groups may be related to differences in females' social position and higher education opportunities in Arctic Norway and Greenland.

The disadvantage of rural living might also be due to small communities and the interconnectedness of the people in such contexts. Any suicide serves as an example of a solution for others [47]. The Arctic region's pattern of scattered habitation might challenge psychosocial treatment to people and families in distress [51] and adolescents opportunities for education and work, and access to community-level health care that reflects the location and the ethnic group knowledge

[41]. The help offered should be easily accessible, high quality, and locally anchored to ensure cultural sensitivity and work with suicide prevention in rural areas.

### ***Group-specific associations***

#### ***Living outside the family***

Due to geographical challenges, many Greenlandic adolescents move away from home to study and feel lost and lonely in that period [52]. We found that living outside the biological family was associated with suicidal thoughts among Inuit females. Moving away from the family to go to school at an early age, perhaps already after 7<sup>th</sup> grade (12–13 years old), might be difficult and lead to suicidal thoughts for some adolescents.

#### ***Stepparent family***

Sami males living in a stepparent family had higher odds of reporting suicidal thoughts and attempts, and Sami females living in a stepparent-family had higher odds of suicide thoughts. This family pattern has previously been associated with suicide attempts among Sami adolescents [49]. Wille, Bettge [53] found that adverse family climate was a particularly negative contributor to children's mental health. The breaking up of the original family and increased conflict levels might cause a negative family environment in stepparent families. In contrast, pronounced individual, family, and social resources coincide with reduced mental health problems. Our findings show the importance of a family-perspective in the prevention of adolescents' suicidal behaviour.

#### ***Time with friends***

Like previous analysis from WBYG findings that loneliness (to be alone despite wishing to be with others more) was associated with suicide attempts among Greenlandic 15 to 18-year old males and females, we found that less time spent with friends was associated with higher odds of reporting suicide attempts in the Inuit group. Among Indigenous circumpolar adolescents, friendships can mediate access to cultural assets and act as support. These relationships can also act as a platform for adolescents to build their identity and resilience [54]. Omma and Petersen [55] found that Sami children in Sweden had less social support from friends. Those with a strong ethnic identity experienced lower well-being, perhaps due to more ethnicity-related negative treatment. Inuit adolescents who spend much time with the same ethnic group might be protected against suicide attempts as the risk of experiencing ethnicity-related negative treatment is lower or absent.

We do not know the direction of the association, so it may also be that those adolescents who are struggling with suicidal thoughts or plans avoid contact with friends. Also, we do not know how much time the Inuit adolescents spent with friends at the time of the suicide attempt, before or after the suicide attempt. Based on our findings, we cannot conclude that those who spend less time with friends are necessarily lonelier. However, the association indicates that it is an important aspect of a young person's life to investigate to explore potential suicidal behaviour.

### **School performance**

Among the Inuit females, poor school performance was associated with more suicidal thoughts. In the Inuit group, they were asked to report how they believe they manage school, while the Sami were asked to report their last grades objectively. We believe that subjectively reporting their own achievement is probably associated with a negative attributional style that may be more common among those with suicidal thoughts. Previous research on self-rated health confirms the importance of school achievements in adolescents' self-rated health [26,56] and suicidal behaviour [48]. The findings may also indicate that not doing well in school leads to suicidal thoughts and vice versa; that struggling with suicidal thoughts makes it difficult to manage at school. School is a considerable part of adolescents' lives. Therefore, potential helpers need to explore the roles of schools. Teachers are in a unique position to pick up on struggles with school or suicidal thoughts with which the students might deal.

### **Indigenous language**

Finally, a strong trend of more suicide attempts ( $p = .07$ ) occurred among the Sami adolescents who do not speak Sami, suggesting a protective effect of speaking their own Indigenous language supported by previous research with Inuit migrants in Denmark and Indigenous Canadian communities [25,57].

Suicidal behaviour can be understood as the choice of an individual, but also as a public expression of shared social suffering with historical and socio-cultural roots [9]. The association between mental health problems and the impact of the rapid socio-cultural changes that Arctic Indigenous people have experienced is not well studied [41]. The rapid process of change in cultural and social structures and dealing with distress such as losing someone close to you to suicide affects the health and well-being of young Indigenous adolescents in the Arctic today. The variation in suicidal behaviour rates between Indigenous

communities can be key to understanding underlying factors [8]. However, it is important to consider the positive mechanisms that people hold, such as coping with change, recovering from oppression, and resilient behaviour [58]. Indigenous cultures offer resilience through spirituality, historical continuity, and ties with family, community, and the land [8]. The Sami people have had a longer time adapting to changes than people in Greenland, perhaps explaining the differences in health and societal challenges.

### **Strengths and limitations**

The gender paradox is that more males die from suicide while more females have suicide thoughts, calling 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 NAAHS and WBYG, 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 alcohol use, sexual abuse, and violence, as well as social media. Social media was not yet an important area of young peoples' lives when our study was conducted.

The high response rate and the high number of questions give strength to this study, together with covering many schools and communities, as it was a school-based study.

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 "box."

### **Clinical implications**

Despite high suicidal behaviour rates in the two Indigenous adolescent populations, few if any systematic prevention programs have been applied. The Sámi Norwegian National Advisory Unit for Mental Health and Substance Use (SANKS) offers mental health care in the Sami language in

a culturally sensitive context and arranges courses in suicide prevention. Initiatives to prevent suicidal behaviour in Norwegian, Finnish, and Swedish parts of Sápmi include various programs and courses such as Mental Health First Aid, SafeTALK, and workshops grounded in the Sami cultural practice of yoiking (a Sami form of “singing”) [59]. Among Sami adolescents, however, few ethnic-specific prevention programs have been developed or applied. Unfortunately, national programs have not been translated linguistically or culturally into Sami.

In Greenland, there has been a national strategy for suicide prevention (2013–2019). In 2019, a new telephone line was launched, and a mentalisation programme called Think Inuk helps people not act on their emotions when in crisis [60]. The interdisciplinary program Meeqqat 0–18 helps children transition from kindergarten to school and later on when many adolescents need to move to go to school, an important part of suicide prevention. Despite the increased focus on suicidal behaviour in Greenland by the Arctic Council and in conferences addressing suicide prevention, suicide rates in Greenland have not been decreased effectively [20]. There is still a need for more knowledge about suicidal behaviour in Greenland and Sápmi to develop and apply Indigenous relevant prevention programs effectively.

Developing effective prevention programs is complex. Knowing what to focus on can be a challenge as many factors can cause suicidal thoughts and suicide attempts. Clustering suicides among adolescents is a challenge in many Indigenous communities. Ensuring adequate help to bereaved Indigenous adolescents can prevent future suicide attempts. In an Indigenous context, suicide is seen as an expression of historical, cultural, community, and family disruptions, and suicide prevention should belong to culturally sensitive and locally designed decolonisation projects instead of formal mental health services [9].

Based on our cross-sectional findings, we cannot claim any causal relationships. However, our findings indicate the importance of taking good care of bereaved adolescents, especially females and adolescents struggling with their family situation. Schools have the opportunity and should therefore have the responsibility to care for adolescents who have experienced the suicide of a friend in the same school or class.

## Conclusion

Both prevalence of suicidal behaviour and associated factors differed between Indigenous Sami and

Greenlandic Inuit adolescents and genders, suggesting that future prevention strategies should be sensitive to both culture and gender and societal environments. Almost one-fifth of the participants in this study reported suicide attempts. Considering that they make a high-risk group for repeated suicide attempts, identifying and offering help to adolescents after a suicide attempt is important.

Our findings suggest that environmental and contextual factors such as family- and peer relations and the exposure to suicide in close relations are of strong importance when it comes to the suicidal behaviour of Indigenous adolescents. Hopefully, this increased knowledge will help facilitate effective prevention programs and adjusted health care for Indigenous adolescents dealing with suicidal behaviour. This study may also contribute to better insight into suicidal behaviour in other cultures and communities as well.

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## References

- [1] Stefanac N, Hetrick S, Hulbert C, et al. Are young female suicides increasing? A comparison of sex-specific rates and characteristics of youth suicides in Australia over 2004–2014. *BMC Public Health*. 2019;19(1):1389.
- [2] Young TK, Revich B, Soininen L. Suicide in circumpolar regions: an introduction and overview. *Int J Circumpolar Health*. 2015;74(1):27349.
- [3] Herne MA, Bartholomew ML, Weahkee RL. Suicide mortality among American Indians and Alaska Natives, 1999–2009. *Am J Public Health*. 2014;104(Suppl 3 (Suppl3)):S336–42.
- [4] Statistics A Aboriginal and Torres Strait Islander suicide deaths. [www.abs.gov.au](http://www.abs.gov.au): Australian Bureau of Statistics 2014; 2010.



- [5] Pedersen CB, Dahl-Petersen I, Bjerregaard P. Notat om selvmordstanker og selvmordsforsøg blandt unge i Grønland. In: Videnscenter om børn og unge Paarisa. 2014; 7
- [6] CDCP. WISQARS: leading causes of death reports, national and regional, 1999–2013. Centers for Disease Control and Prevention.; 2015.
- [7] Grande AJ, Elia C, Peixoto C, et al. Mental health interventions for suicide prevention among indigenous adolescents: a systematic review protocol. *BMJ Open*. 2020;10(5):e034055.
- [8] King M, Smith A, Gracey M. Indigenous health part 2: the underlying causes of the health gap. *Lancet*. London, England. 2009;374(9683):76–85.
- [9] Wexler LM, Gone JP. Culturally responsive suicide prevention in indigenous communities: unexamined assumptions and new possibilities. *Am J Public Health*. 2012;102(5):800–806.
- [10] Bridge JA, Goldstein TR, Brent DA. Adolescent suicide and suicidal behavior. *J Child Psychol Psychiatry*. 2006;47(3–4):372–394.
- [11] Grundsoe TL, Pedersen ML. Risk factors observed in health care system 6 months prior completed suicide. *Int J Circumpolar Health*. 2019;78(1):1617019.
- [12] Reigstad B, Kvernmo S. Concurrent adversities and suicide attempts among Sami and non-Sami adolescents: the Norwegian Arctic Adolescent Study (NAAHS). *Nord J Psychiatry*. 2017;71(6):425–432.
- [13] McLoughlin AB, Gould MS, Malone KM. Global trends in teenage suicide: 2003–2014. *QJM*. 2015;108(10):765–780.
- [14] ILO. General Observation, Indigenous and Tribal Peoples, 81st Session, 2010. International Labour Conference, 100th session Report III (1A).. ILO Committee of Experts on the Application of Conventions and Recommendations; 2011. Nepal.
- [15] SSB. Urbefolkningen i tall - samisk statistikk 2012 [Available from: <https://www.ssb.no/befolkning/artikler-og-publikasjoner/urbefolkningen-i-tall-samisk-statistikk>].
- [16] Andresen A, Evjen B, Ryymin T. Samenes Historie fra 1751 til 2010. 1st ed. Oslo, Norway: Cappelen Damm Akademisk; 2021.
- [17] Kvernmo S, Heyerdahl S. Acculturation strategies and ethnic identity as predictors of behavior problems in arctic minority adolescents. *J Am Acad Child Adolesc Psychiatry*. 2003;42(1):57–65.
- [18] Sámediggi. About the Sámi Parliament 2021 [Available from: <https://sametinget.no/about-the-sami-parliament>].
- [19] Hansen KL, Minton SJ, Friborg O, et al. Discrimination amongst Arctic indigenous Sami and Non-Sami populations in Norway. *J Northern Studies*. 2016;10:2.
- [20] Bjerregaard P, Larsen CV. Time trend by region of suicides and suicidal thoughts among Greenland Inuit. *Int J Circumpolar Health*. 2015;74(1):26053.
- [21] Bjorksten KS, Bjerregaard P. Season of birth is different in Inuit suicide victims born into traditional than into modern lifestyle: a register study from Greenland. *BMC Psychiatry*. 2015;15(1):147.
- [22] Moltke I, Fumagalli M, Korneliusen TS, et al. Uncovering the genetic history of the present-day Greenlandic population. *Am J Hum Genet*. 2015;96(1):54–69.
- [23] Bjerregaard P, Larsen CV. Health Aspects of Colonization and the Post-Colonial Period in Greenland 1721 to 2014. *J Northern Studies*. 2016;10(2):85–106.
- [24] Hansen AM, Vanclay F, Croal P, et al. Managing the social impacts of the rapidly-expanding extractive industries in Greenland. *Extr Ind Soc*. 2016;3:1.
- [25] Bjerregaard P, Lyngø I. Suicide—a challenge in modern Greenland. *Archives Suicide Res*. 2006;10(2):209–220.
- [26] Spein AR, Pedersen CP, Silvikén AC, et al. Self-rated health among Greenlandic Inuit and Norwegian Sami adolescents: associated risk and protective correlates. *Int J Circumpolar Health*. 2013;72:72.
- [27] Curtis T, Larsen FB, Helweg-Larsen K, et al. Unge trivsel i Grønland 2004. Greenland Homerule, Directorate on Culture, Education, Research and Church. *Arktisk forskningsjournal*. 2006;1(1):1-119. Nuuk Greenland.
- [28] Sjölander P. What is known about the health and living conditions of the indigenous people of northern Scandinavia, the Sami? *Glob Health Action*. 2011;4:4.
- [29] Kvernmo S. Mental health of Sami youth. *Int J Circumpolar Health*. 2004;63(3):221–234.
- [30] Silvikén A. Prevalence of suicidal behaviour among indigenous Sami in northern Norway. *Int J Circumpolar Health*. 2009;68(3):204–211.
- [31] Olano FA, Rasmussen J. [Psychiatric disorders in Greenland]. *Ugeskr Laeger*. 2019;181(47):47.
- [32] Curtis T, Kvernmo S, Bjerregaard P. Changing living conditions, life style and health. *Int J Circumpolar Health*. 2005;64(5):442–450.
- [33] Minde H. Assimilation of the Sami - implementation and consequences. *Nordic J Circumpolar Soc*. 2010;20:2.
- [34] Bjorksten KS, Kripke DF, Bjerregaard P. Accentuation of suicides but not homicides with rising latitudes of Greenland in the sunny months. *BMC Psychiatry*. 2009;9(1):20.
- [35] Kvernmo S, Heyerdahl S. Influence of ethnic factors on behavior problems in indigenous Sami and majority Norwegian adolescents. *J Am Acad Child Adolesc Psychiatry*. 1998;37(7):743–751.
- [36] Beauvais AL. Gender issues in youth suicidal behaviour. *Emergency Med*. Fremantle, WA. 2002;14(1):35–42.
- [37] McMahon EM, Keeley H, Cannon M, et al. The iceberg of suicide and self-harm in Irish adolescents: a population-based study. *Soc Psychiatry Psychiatr Epidemiol*. 2014;49(12):1929–1935.
- [38] Saudny H, Leggee D, Egeland G. Design and methods of the adult Inuit Health Survey 2007–2008. *Int J Circumpolar Health*. 2012;71(1).
- [39] Zygo M, Pawlowska B, Potembska E, et al. Prevalence and selected risk factors of suicidal ideation, suicidal tendencies and suicide attempts in young people aged 13–19 years. *Ann Agri Environ Med*. 2019;26(2):329–336.
- [40] Omma L, Sandlund M, Jacobsson L. Suicidal expressions in young Swedish Sami, a cross-sectional study. *Int J Circumpolar Health*. 2013;72:72.
- [41] Broderstad AR, Eliassen BM, Melhus M. Prevalence of self-reported suicidal thoughts in SLiCA. The Survey of Living Condition in the Arctic (SLiCA). *Glob Health Action*. 2011;4:4.
- [42] Robinson J, Too LS, Pirkis J, et al. Spatial suicide clusters in Australia between 2010 and 2012: a comparison of cluster and non-cluster among young people and adults. *BMC Psychiatry*. 2016;16(1):417.
- [43] Grossman DC, Milligan BC, Deyo RA. Risk factors for suicide attempts among Navajo adolescents. *Am J Public Health*. 1991;81(7):870–874.

- [44] Clark TC, Robinson E, Crengle S, et al. Risk and protective factors for suicide attempt among Indigenous Māori Youth in New Zealand: the Role of Family Connection. *J de la santé autochtone*. 2011. March: 16-31.
- [45] Silvikén A, Haldorsen T, Kvernmo S. Suicide among Indigenous Sami in Arctic Norway, 1970–1998. *Eur J Epidemiol*. 2006;21(9):707–713.
- [46] Abrutyn S, Mueller AS. Are suicidal behaviors contagious in adolescence?: using longitudinal data to examine suicide suggestion. *Am Sociological Rev*. 2014;79(2):211–227.
- [47] Clarke VA, Frankish CJ, Green LW. Understanding suicide among indigenous adolescents: a review using the PRECEDE model. *Inj Prevention*. 1997;3(2):126–134.
- [48] Swedo SE, Rettew DC, Kuppenheimer M, et al. Can adolescent suicide attempters be distinguished from at-risk adolescents? *Pediatrics*. 1991;88(3):620–629.
- [49] Silvikén A, Kvernmo S. Suicide attempts among indigenous Sami adolescents and majority peers in Arctic Norway: prevalence and associated risk factors. *J Adolesc*. 2007;30(4):613–626.
- [50] Bolliger L, Gulis G. The tragedy of becoming tired of living: youth and young adults' suicide in Greenland and Denmark. *Int J Soc Psychiatry*. 2018;64(4):389–395.
- [51] Le Fevre AC. The challenge of reducing youth suicide in Greenland—interventions, strategies and roads to be explored. *Int J Circumpolar Health*. 2004;63(Suppl 2):38–40.
- [52] Karsberg S. Mental health among youth in Greenland 2016. Available from: [https://nordicwelfare.org/wp-content/uploads/2017/10/gronland\\_webb.pdf](https://nordicwelfare.org/wp-content/uploads/2017/10/gronland_webb.pdf).
- [53] Wille N, Bettge S, Ravens-Sieberer U. Risk and protective factors for children's and adolescents' mental health: results of the BELLA study. *Eur Child Adolesc Psychiatry*. 2008;17(Suppl 1):133–147.
- [54] Wexler L, Joule L, Garoutte J, et al. "Being responsible, respectful, trying to keep the tradition alive:" cultural resilience and growing up in an Alaska Native community. *Transcult Psychiatry*. 2014;51(5):693–712.
- [55] Omma L, Petersen S. Health-related quality of life in indigenous Sami schoolchildren in Sweden. *Acta paediatrica*. Oslo, Norway: 1992. 2015;104(1):75–83.
- [56] Bombak AE, Bruce SG. Self-rated health and ethnicity: focus on indigenous populations. *Int J Circumpolar Health*. 2012;71(1):18538.
- [57] Hallet D, Chandler MJ, Lalonde CE. Aboriginal language knowledge and youth suicide. *Cogn Dev*. 2007;22(3):392–399.
- [58] Bals M, Turi AL, Skre I, et al. Internalization symptoms, perceived discrimination, and ethnic identity in indigenous Sami and non-Sami youth in Arctic Norway. *Ethn Health*. 2010;15(2):165–179.
- [59] Stoor JPA. Suicide among Sámi: cultural meanings of suicide and interventions for suicide prevention in Nordic parts of Sápmi. Tromsø: UiT The Arctic University of Norway; 2020.
- [60] Abelsen M. Besvarelse af § 37 spørgsmål vedr. selvmordsforebyggelse nr. 046–2020. [https://ina.gl/documents/para3637/2020/svar/046\\_2020\\_selvmordsforebyggelse\\_MAVR\\_svar.pdf](https://ina.gl/documents/para3637/2020/svar/046_2020_selvmordsforebyggelse_MAVR_svar.pdf). Government of Greenland; 2020.