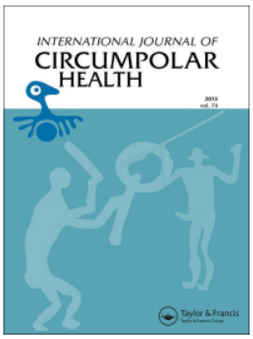

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Opioid prescriptions among Sami and non-Sami with chronic pain: The SAMINOR 2 Questionnaire Survey and the Norwegian Prescription Database

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ABSTRACT

This study is the first to investigate the prevalence of filled opioid prescriptions among indigenous Sami people with self-reported chronic musculoskeletal pain (CMSP) and compare it with that of non-Sami living in the same area. Baseline data from the SAMINOR 2 Questionnaire Survey (2012) was linked prospectively to the Norwegian Prescription Database. Information on filled opioid prescriptions during 2012–2019 was collected for 4767 persons who reported CMSP in SAMINOR 2. Gender-stratified chi-square tests, two-sample *t*-tests, Kruskal – Wallis tests, and multinomial logistic regression was applied. Two out of three CMSP respondents received no or only one prescription of opioids during 2012–2019. In each year, 80% of women received no opioids, 7–10% received one prescription of ≤ 180 defined daily doses (DDD), 8–9% received in total ≤ 180 DDD in two or more prescriptions, and 2–3% received > 180 DDD of opioids. Among men, 81–83% received no opioids, 8–11% received one prescription with ≤ 180 DDD, 5–9% received ≤ 180 DDD in two or more prescriptions, and 1–2% received > 180 DDD of opioids in a single year. There were no overall ethnic differences, which indicates a similar prescription policy for opioids for Sami and non-Sami with CMSP.

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chronic musculoskeletal pain; analgesic; opioids; indigenous; Sami; SAMINOR; NorPD

Introduction

The indigenous Sami people mainly populate the northern and middle parts of Norway, Sweden, Finland, and the Kola Peninsula of the Russian Federation. The largest number of Sami people live in Norway. Like many other indigenous groups in the Arctic, the Sami have been subjected to harsh assimilation and discrimination [1,2].

Chronic pain is a significant health problem worldwide [3,4]. It is a leading contributor to sick leave, disability pensions and Norway's disease burden [5]. In a study of chronic pain in Europe, the highest prevalence was found in Norway [3]. Both the HUNT Study and the Tromsø Study have found high prevalences of chronic musculoskeletal pain (CMSP) [6,7]. These studies do not include information about Sami ethnicity. Studies from other countries indicate that chronic pain is more prevalent among ethnic minority groups [8]. Indigenous populations in the United States and Canada have been shown to be more prone to rheumatic diseases, headaches, low back pain and other conditions associated with chronic pain than the majority population [8–10]. Overall, studies on the prevalence of CMSP among the Sami compared with non-Sami living in the same geographic areas in Norway have found no or only minor differences [11–14]. Some studies found a higher prevalence of CMSP among the Sami for some pain sites [11–13], while another study found less CMSP for Sami women aged 60–79 years than non-Sami women in the same age group [15].

Opioid analgesics are often prescribed for post-operative pain, acute pain and cancer pain. They may also be given to patients with chronic non-malignant pain, which sometimes causes a person to continue the treatment for years. The effect of opioid treatment for chronic pain is disputed [16,17]. The negative side effects are found to be severe and include dependence, opioid-related injuries, decreased cognitive function and overdose [18,19]. According to the Stanford-Lancet Commission, opioids show little to no effectiveness in the

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treatment of chronic pain and may instead worsen pain perception and quality of life overall [20]. The liberal prescription of opioids in the US and Canada, has devastating consequences, like addiction, overdose, and death. This has been highly debated and criticised, and further labelled as an opioid crisis [21–23]. In the US and Canada, opioid abuse has been documented for decades. Today, it is considered an epidemic with substantial negative health effects due to the scale of the problem and the high rate of overdose deaths.

In contrast to the US and Canada, many European countries do not have an opioid crisis even though prescription of opioids for the treatment of chronic pain is increasing in some European countries [24–26]. On a national level, opioid utilisation in Norway has remained relatively stable. In 2020, 10.2% of the Norwegian population filled at least one prescription for opioids, decreasing from its peak 10.7% in 2016 [27]. In the same period, Norwegians who filled at least one prescription of oxycodone increased from 0.8% to 1.1% [27]. These trends are almost ubiquitous in the Nordic countries, where the prevalence of opioid dispensation is either stable or decreasing, while oxycodone dispensation and subsequent intensity of treatment is increasing [28,29].

Studies on ethnic differences in prescriptions of opioids in the treatment of pain have mainly been conducted in the U.S. and have shown disparities across ethnic groups [30–33], while others have not [34,35]. One study found that providers were more likely to underestimate pain reported by minority patients [36], and others that culture may affect how pain is expressed [37,38]. Results from a study in northern Norway indicate that patterns of interpretation and expression of pain in adult life are established in childhood and influenced by parenting styles and values [39]. It was found that Sami and Norwegian children reacted differently to a tougher disciplinary parenting style. In their child rearing, Sami parents placed a strong value on inner strength, hardiness, and the child's ability to withstand hardships [39]. This might have led to that the Sami minimise how the pain affects them or express less chronic pain to their physician, possibly leading to less prescriptions of opioids. Cultural differences between physicians and minority patients may impede communication, and hence the prescriptions of opioids.

Little is known about the prescription of opioids among the Sami with CMSP. This study aimed to estimate the prevalence and amount of filled prescriptions of opioids among the Sami and the non-Sami with CMSP and to examine any ethnic differences.

Methods

The study design is prospective; a cohort of 4738 persons was followed for eight calendar years. The study is based on linkage of data from the SAMINOR 2 Questionnaire Survey, the Norwegian Prescription Database (NorPD) and national register data from Statistic Norway, facilitated by unique national personal identification numbers.

Data source

The SAMINOR 2 Questionnaire Survey

The cohort was identified among the participants in the SAMINOR 2 Questionnaire Survey, (hereafter referred to as SAMINOR 2), conducted in 2012 by the Centre for Sami Health Research, UiT The Arctic University of Norway. The survey was part of the second wave of the Population-based Study on Health and Living Conditions in Regions with Sami and Norwegian Populations (the SAMINOR Study).

The Norwegian Prescription Database

The NorPD is a national registry of all filled prescriptions to individual patients from Norwegian pharmacies and was established 1 January 2004 (http://www.norpd.no). Drugs dispensed in hospitals or nursing homes or purchased without prescriptions are not included in the NorPD. Drugs are classified according to the Anatomical Therapeutic Chemical (ATC) classification. A unique personal identity number identifies the patients, making it possible to follow them over time. Data from the NorPD include ATC code, drug quantity measured in defined daily dose (DDD), date of dispensing and a code to identify prescriptions due to palliative care. DDD is a unit of measurement for the assumed average maintenance dose per day for a drug used for its main indication in adults [40].

Statistics Norway (SSB)

Year of death was collected from SSB from 1 January 2012 until 31 December 2019, and data on emigration was collected from 1 January 2012 until 31 December 2017.

Study period

Questionnaires from participants in SAMINOR 2 were collected between January and October 2012. The majority of participants handed in their questionnaire during

January 2012. We analysed filled opioid prescriptions in the period from 1 January 2012 until 31 December 2019.

Study population

The invited SAMINOR 2 population included all inhabitants aged 18–69 years living in 25 selected multiethnic municipalities (mixed Sami and non-Sami populations) in northern and central Norway (in six of the municipalities, only selected districts were included). The selected municipalities are core areas of Sami settlement in Norway. Out of 43,245 invitees, 11600 participated, yielding a response rate of 27%. Details regarding the survey are given elsewhere [36]. The questionnaire, including an English translation, is available at www.saminor.no. The present study included 4802 respondents with self-reported CMSP, defined as those giving a positive answer to the question, "Have you during the last year suffered from pain and/or stiffness in muscles and joints that have lasted continuously for at least 3 months?" (41.4% of the total response sample). However, 35 respondents were excluded due to missing information on ethnicity, 29 who died or emigrated in 2012 or received opioid prescriptions due to palliative care in 2012, leaving 4738 persons eligible for the study (Figure 1). Of these, 2879 (60.8%) were women and 1859 (39.2%) were men. For each year of follow-up, respondents who died, emigrated, or had received prescriptions due to palliative care during the respective year were excluded from the sample. This reduced the sample size slightly for each year, leaving 4566 respondents in the final study sample in 2019 (Figure 1).

Variables from SAMINOR 2

Ethnicity

Ethnicity was categorised as Sami or non-Sami based on the questionnaire information. To be categorised

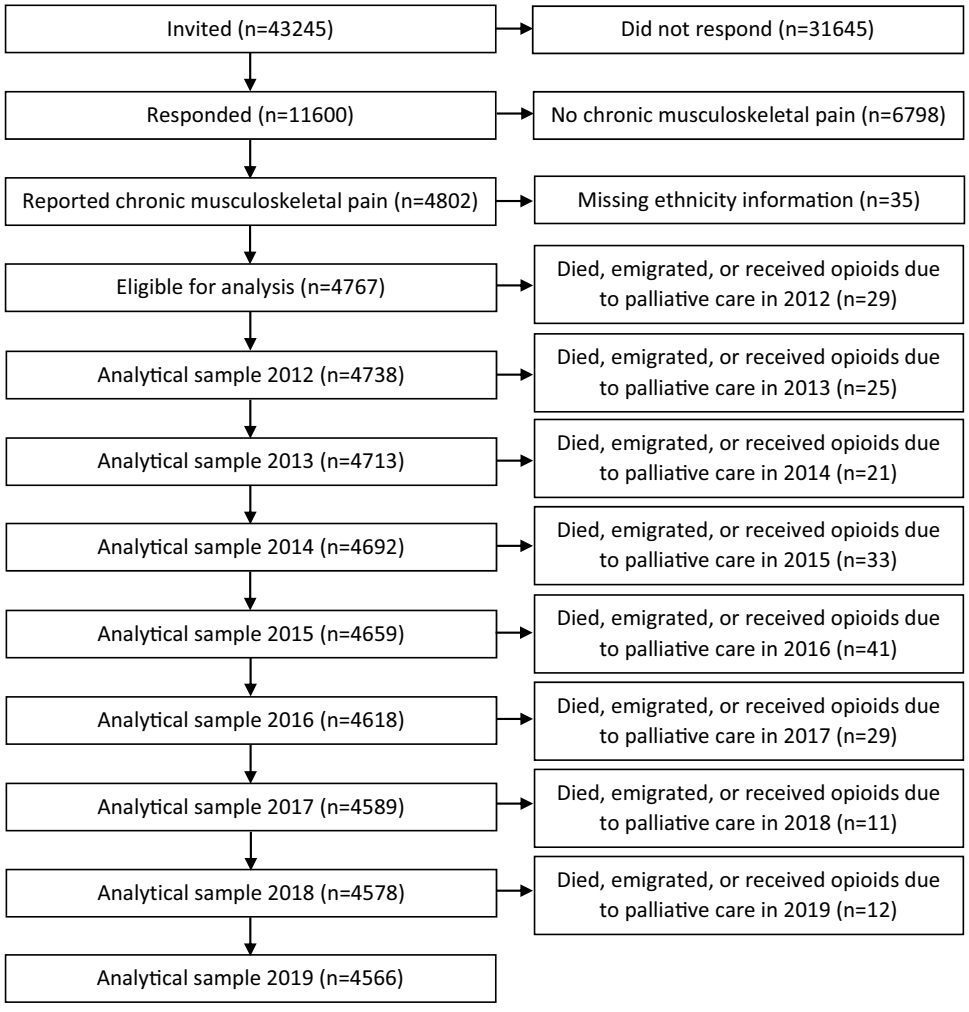

Figure 1. Flow chart of inclusion in the study population of opioid prescriptions among Sami and non-Sami with chronic musculoskeletal pain: The SAMINOR 2 Questionnaire Survey and the Norwegian Prescription Database.

as Sami, the respondents had to consider themselves Sami and report at least one Sami linguistic affiliation (themselves, a parent or a grandparent used Sami as their home language). All other participants were categorised as non-Sami. This classification resulted in 1026 Sami (21.7%) and 3712 non-Sami (78.3%).

Level of education

Level of education was used as a proxy for socioeconomic status. Education was reported in the questionnaire as the total number of years of completed education. This was categorised into four groups, which roughly correspond to the educational levels mentioned in parentheses: 0–9 years (primary school), 10–12 years (secondary school), 13–15 years (college/university, 1–3 years), and 16 years and more (college/university, four years or more).

Age and gender

Age (at the beginning of the participation year) and gender were retrieved from the National Population Registry.

Alcohol intake

Respondents were asked to indicate how often they had consumed alcohol in the last year. Due to small numbers in some of the categories, the eight possible response options were collapsed into three categories prior to our availability to the dataset: Seldom/Never, Monthly and Weekly.

Information on opioid dispensation from the NorPD

The main outcome was the filled prescriptions of analgesic opioids (ATC codes N02A) from the Norwegian pharmacies. That is, we included ATC codes N02A, whereof N02AJ, N02AX02 are considered weak opioids. Other opioids for opioid maintenance therapy (N07BC) which have a main indication other than analgesia were not included. All opioids, regardless of administration forms, were included due to lack of information on administration. The amount of opioids is expressed in terms of the number of DDD from the NorPD.

Analytic strategy and statistical analyses

A total of 4738 CMSP respondents in SAMINOR 2 were identified and included in the analytical cohort. Since few participants received strong opioids, analysis per year for use of strong opioids alone was not possible. Therefore, the total DDDs of both weak and strong opioids for each year was calculated. In the analyses, the respondents were divided into four groups according to their level of opioid use each year:

Group 1: No opioid prescriptions
Group 2: ≤180 DDD of opioids, one prescription only
Group 3: ≤180 DDD of opioids, two or more prescriptions
Group 4: >180 DDD of opioids

The total DDD amount for all eight years combined was also calculated and divided into the same four categories, first for all opioids, and then separately for strong and weak opioids. In addition, we calculated the number of years they had received > 180 DDD of opioids.

All analyses are stratified by gender. Descriptive statistics are presented according to ethnicity and gender. Age differences were tested with two-sample t-tests. The Pearson's chi-square test was used for categorical variables to compare the Sami and the non-Sami, including the categorical distribution of received DDDs of opioids (the four groups mentioned above) for each calendar year and in total. For the total DDD of opioids each year, the means, standard deviations, medians, and first and third quartiles were also calculated (not presented in the tables). To compare the mean DDD of opioids between the Sami and the non-Sami, a two-sample t-test was used. A non-parametric Kruskal – Wallis test was also performed. Multinominal logistic regression analyses were conducted, with opioid use categorised in the four mentioned groups as a dependent variable, using the "no prescriptions" group as the reference. This approach was chosen over linear regression to be able to distinguish between those receiving prescriptions of opioids on one occasion only as compared to several occasions. Ethnicity was used as the main predictor, and we adjusted for age, educational level, and alcohol intake.

All statistical analyses were performed using IBM SPSS Statistics Version 28.0. The level of significance was set to 5%.

Ethics

The data collection and storage were approved by the Norwegian Data Protection Authority (Datatilsynet). Written informed consent was obtained from all participants. Research involving human subjects complied with all relevant national regulations and institutional policies and was in accordance with the tenets of the Helsinki Declaration. The study was approved by the Regional Committee for Medical and Health Research Ethics (REK-Sør-Øst, number 23,394), the SAMINOR Project Board, UiT the Arctic University of Norway, the Norwegian Centre for

Research Data (NSD), Statistics Norway (SSB) and the Norwegian Prescription Database (NorPD).

Results

Baseline sample characteristics are presented in Table 1 (women) and Table 2 (men). There were no significant differences in age between Sami and non-Sami women (mean age 48.8) or between Sami and non-Sami men (mean age 52.2). Sami women reported a higher educational level than non-Sami women ($p < 0.001$), while there was no difference in educational level among men ($p = 0.69$). A higher proportion of Sami women reported to seldom/never consume alcohol than non-Sami women ($p < 0.001$), while there was no significant difference in alcohol consumption among men (Tables 1 and 2).

Studying each year separately, the prescription of opioids was stable over time. During a single year, around 80% of women with CMSP used no opioids, 6–10% received only one prescription of opioids with ≤ 180 DDD, 8–10% received two or more prescriptions with ≤ 180 DDD in total, and around 2% received > 180 DDD. There were no significant differences between Sami and non-Sami women (Table 3), except for 2019, when a higher proportion of non-Sami women than Sami women received small doses (≤180 DDD) of opioids in only one prescription ($p = .03$). Among men, the pattern was similar, with no significant ethnic differences (Table 4); 80–85% did not use opioids at all in a particular year, 8–11% had only received one prescription with ≤ 180 DDD, 5–9% received ≤ 180 DDD in total in two or more prescriptions, and 1–2% received > 180 DDD. Adjusting for age, educational level, and alcohol consumption in multinomial logistic regression analyses did not change the conclusions (results not shown); the only significant ethnic difference was observed for women in 2019 ($p = .016$).

For those receiving prescriptions of opioids, both the mean and the median DDD remained relatively stable over the period 2012–2019 for women and men, Sami and non-Sami (results not shown in the tables). As expected, the distribution of DDD was skewed, with a minor proportion receiving very high DDD of opioids (data not shown). Among women, the mean DDD ranged from 67 to 106 - per year, while the median was 13 to 22 DDD. A statistically significant ethnic difference was observed only for 2019, with a higher median DDD among Sami women than non-Sami women (22 and 13 DDD, respectively, $p = 0.042$). Among men, the mean DDD was between 47 and 67 and the median DDD was 13 to 17. No statistically significant differences were observed between Sami and non-Sami men for any year (results not shown in the tables).

Table 1. Baseline characteristics of Sami and non-Sami women reporting chronic musculoskeletal pain by ethnicity: the SAMINOR 2 Questionnaire Survey (2012, $n = 2879$).

	All women ($n = 2879$)	Sami ($n = 621$)	Non-Sami ($n = 2258$)	P-value[b]
Age (years), mean (SD)a	48.8 (12.9)	48.3 (13.2)	49.0 (12.8)	.29[a]
Educational level, % (n)				<.001[b]
Primary school	14.2 (403)	13.7 (84)	14.3 (319)	
Secondary school	27.6 (785)	20.7 (127)	29.5 (658)	
College/university 1–3 years	26.3 (749)	27.4 (168)	26.0 (581)	
College/university ≥4 years	31.9 (909)	38.3 (235)	30.2 (674)	
Alcohol intake, % (n)				<.001[b]
Seldom/never	38.7 (1095)	46.6 (285)	36.5 (810)	
Monthly	26.1 (737)	19.0 (116)	28.0 (621)	
Weekly	35.2 (997)	34.4 (210)	35.5 (787)	

Abbreviations: SD, standard deviation; [a]Comparing Sami and non-Sami by two-sample t-test; [b]Comparing Sami and non-Sami by Pearson's chi-square test. Missing values, Education level: $n = 33$ (1.1%); Missing values alcohol intake: $n = 50$ (1.7%).

Table 2. Baseline characteristics of Sami and non-Sami men reporting chronic musculoskeletal pain by ethnicity: the SAMINOR 2 Questionnaire Survey (2012, $n = 1859$).

	All men ($n = 1859$)	Sami ($n = 405$)	Non-Sami ($n = 1454$)	P-value[b]
Age (years), mean (SD)a	52.2 (12.0)	52.3 (11.5)	52.2 (12.1)	.89[a]
Educational level, % (n)				.69[b]
Primary school	21.9 (403)	22.0 (88)	21.9 (315)	
Secondary school	35.7 (657)	37.8 (151)	35.2 (506)	
College/university 1–3 years	23.0 (423)	22.8 (91)	23.1 (332)	
College/university ≥4 years	19.3 (355)	17.5 (70)	19.8 (285)	
Alcohol intake, % (n)				.62
Seldom/never	28.5 (519)	28.2 (112)	28.5 (407)	
Monthly	36.7 (669)	35.0 (139)	37.2 (530)	
Weekly	34.8 (635)	36.8 (146)	34.3 (489)	

Abbreviations: SD, standard deviation; [a]Comparing Sami and non-Sami by two-sample t-test; [b]Comparing Sami and non-Sami by Pearson's chi-square test. Missing values, education level: $n = 28$ (1.5%); Missing values, alcohol intake: $n = 36$ (1.9%).

Table 3. Filled prescriptions of opioids categorised in four groups according to Defined Daily Dose (DDD[d]), among Sami and non- Sami women who reported chronic musculoskeletal pain, the SAMINOR 2 Questionnaire Survey (2012) and the Norwegian Prescription Database (2012–2019).

		Sami				Non-Sami				
		No prescriptions	≤180 DDD 1 prescription	≤180 DDD 2 or more prescriptions	>180 DDD	No prescriptions	≤180 DDD 1 prescription	≤180 DDD 2 or more prescriptions	>180 DDD	
Year	n	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)	P-value[a]
2012[b]	2879	81.3 (505)	7.2 (45)	9.0 (56)	2.4 (15)	79.8 (1802)	9.9 (223)	8.5 (193)	1.8 (40)	.18
2013[b]	2868	80.6 (499)	7.6 (47)	9.5 (59)	2.3 (14)	79.5 (1788)	9.4 (211)	9.2 (208)	1.9 (42)	.53
2014[b]	2859	78.6 (485)	9.7 (60)	9.2 (57)	2.4 (15)	80.1 (1796)	9.6 (216)	7.6 (170)	2.7 (60)	.59
2015[b]	2846	78.6 (485)	9.9 (61)	8.9 (55)	2.6 (16)	78.1 (1741)	11.8 (263)	7.7 (171)	2.4 (54)	.46
2016[b]	2830	80.2 (493)	9.3 (57)	7.8 (48)	2.8 (17)	80.1 (1775)	9.2 (204)	8.4 (186)	2.3 (50)	.87
2017[b]	2814	80.0 (489)	8.7 (53)	8.2 (50)	3.1 (19)	80.2 (1766)	9.2 (202)	8.3 (182)	2.4 (53)	.79
2018[c]	2812	79.7 (486)	9.5 (58)	8.7 (53)	2.1 (13)	77.8 (1714)	11.8 (259)	8.3 (182)	2.1 (47)	.48
2019[c]	2806	82.9 (505)	5.7 (35)	9.4 (57)	2.0 (12)	80.9 (1777)	9.1 (201)	7.5 (165)	2.5 (54)	.03
2012–2019 combined	2806	49.8 (303)	16.9 (103)	25.6 (156)	7.7 (47)	44.9 (987)	17.9 (393)	30.0 (659)	7.2 (158)	.11
2012–2019 combined, weak opioids[d]	2806	50.4 (307)	17.1 (104)	24.8 (151)	7.7 (47)	45.7 (1004)	18.0 (396)	29.4 (647)	6.8 (150)	.08
2012–2019 combined, strong opioids[e]	2806	94.9 (578)	2.3 (14)	2.1 (13)	0.7 (4)	92.7 (2037)	2.5 (55)	3.8 (84)	1.0 (21)	.19

Abbreviations: DDD, Defined Daily Dose; [a]Comparing Sami and non-Sami by Pearson's chi-square test; [b]excluded persons who died, emigrated, or received palliative treatment; [c]excluded persons who died or received palliative treatment. [d]Weak opioids includes ATC codes N02AJ, N02AX02; [e]Strong opioids includes ATC codes N02AA, N02AB, N02AC, N02AD01 N02AE, N02AG, N02AX06.

Table 4. Filled prescription of opioids categorised in four groups according to Defined Daily Dose (DDD[d]), among Sami and non-Sami men who reported chronic musculoskeletal pain, the SAMINOR 2 Questionnaire Survey (2012) and the Norwegian Prescription Database (2012–2019).

		Sami				Non-Sami				
Year	N	No prescriptions % (n)	≤180 DDD 1 prescription % (n)	≤180 DDD 2 or more prescriptions % (n)	>180 DDD % (n)	No prescriptions % (n)	≤180 DDD 1 prescription % (n)	≤180 DDD 2 or more prescriptions % (n)	>180 DDD % (n)	P-value[a]
2012[b]	1859	80.5 (326)	8.6 (35)	9.4 (38)	1.5 (6)	81.2 (1181)	9.1 (133)	7.9 (115)	1.7 (25)	.79
2013[b]	1845	81.3 (327)	9.2 (37)	8.5 (34)	1.0 (4)	82.8 (1195)	8.7 (125)	6.8 (98)	1.7 (25)	.48
2014[b]	1833	81.8 (328)	8.2 (33)	9.0 (36)	1.0 (4)	82.4 (1180)	8.4 (121)	7.6 (109)	1.5 (22)	.70
2015[b]	1813	81.6 (324)	11.1 (44)	6.3 (25)	1.0 (4)	79.9 (1131)	10.2 (145)	8.4 (119)	1.5 (21)	.47
2016[b]	1788	81.5 (317)	9.8 (38)	7.5 (29)	1.3 (5)	82.1 (1149)	8.1 (114)	8.1 (113)	1.6 (23)	.72
2017[b]	1775	81.7 (317)	9.0 (35)	8.0 (31)	1.3 (5)	84.1 (1166)	7.3 (101)	7.1 (98)	1.6 (22)	.59
2018[c]	1766	81.1 (314)	9.6 (37)	8.3 (32)	1.0 (4)	81.7 (1127)	9.9 (136)	6.8 (94)	1.6 (22)	.66
2019[c]	1760	83.4 (322)	8.8 (34)	6.2 (24)	1.6 (6)	85.4 (1174)	7.6 (105)	5.2 (729)	1.7 (23)	.75
2012–2019 combined	1760	46.1 (178)	19.2 (74)	28.0 (108)	6.7 (26)	47.6 (654)	18.3 (252)	27.5 (378)	6.6 (90)	.96
2012–2019 combined, weak opioids[d]	1760	46.9 (181)	18.7 (72)	27.7 (107)	6.7 (26)	48.8 (670)	18.3 (251)	26.7 (367)	6.3 (86)	.93
2012–2019 combined, strong opioids[e]	1760	94.0 (363)	3.4 (13)	2.3 (9)	0.3 (1)	94.0 (1292)	1.9 (26)	3.6 (49)	0.5 (7)	.19

Abbreviations: DDD, Defined Daily Dose; [a]Comparing Sami and non-Sami by Pearson's chi-square test. [b]excluded persons who died, emigrated, or received palliative treatment, [c]excluded persons who died or received palliative treatment; [d]Weak opioids includes ATC codes N02AJ, N02AX02; [e]Strong opioids includes ATC codes N02AA, N02AB, N02AC, N02AD01, N02AE, N02AG, N02AX06.

Table 5. The association between filled prescriptions of opioids and Sami ethnicity among women and men who reported chronic musculoskeletal pain. The SAMINOR 2 Questionnaire Survey (2012) and the Norwegian Prescription Database (2012–2019).

Year	≤180 DDD 1 prescription	P-value	≤180 DDD 2 or more prescriptions	P-value	>180 DDD	P-value
Women	AOR[a]		AOR[a]		AOR[a]	
2012	.72	.06	.99	.20	1.4	.32
2013	.79	.19	1.1	.70	1.2	.49
2014	1.1	.76	1.3	.13	.95	.87
2015	.95	.77	1.2	.25	1.1	.72
2016	.96	.80	.89	.50	1.3	.39
2017	.95	.77	1.0	.90	1.3	.29
2018	.92	.61	.96	.81	1.3	.44
2019	.62	.01	1.2	.35	.79	.47
2012–2019	.87	.29	.77	.02	.96	.81
Men						
2012	.95	.80	1.2	.31	.88	.78
2013	1.1	.54	1.3	.28	.59	.33
2014	.92	.71	1.2	.48	.65	.44
2015	1.1	.65	.69	.11	.67	.46
2016	1.2	.29	.89	.62	.79	.64
2017	1.3	.15	1.2	.56	.84	.73
2018	.97	.84	1.1	.54	1.1	.87
2019	1.1	.53	1.2	.45	.79	.63
2012–2019	1.1	.72	1.0	.78	.99	.96

Abbreviations: DDD, Defined Daily Dose; AOR, adjusted odds ratio; [a]adjusted for age, educational level, and alcohol consumption; Notes: Results are from multinomial logistic regression with opioid use in four categories as dependent variable ("no opioids" as reference), and Sami ethnicity as exposure (non-Sami as reference).

There were no statistically significant ethnic or gender differences when combining all opioid prescriptions in the period 2012–2019 (Tables 3 and 4). About half of the respondents who reported chronic pain were not prescribed any opioids at all during the eight-year period. One in six received only one prescription with 180 DDD or less during these eight years, and only 7–8% received more than 180 DDD in total (Tables 3 and 4). Strong opioids constituted approximately 10% of the total sum of DDDs (results not shown in the tables). No statistically significant ethnic differences were observed when analysing weak and strong opioids separately for the period 2012–2019 combined (Tables 3 and 4).

Less than 1% of the chronic pain respondents were prescribed more than 180 DDD every single year in the period 2012–2019 (results not shown in the tables). These were persistent, high-dose users, and there were no differences based on ethnicity or gender (results not shown). Multinomial logistic regression analyses, adjusting for age, education level and alcohol consumption, confirmed the conclusion of no ethnic differences (Table 5).

Discussion

The current study provides novel information about filled prescriptions of opioids among CMSP respondents in a mixed population of Sami and non-Sami people in Norway.

During the eight-year study period, around half of the CMSP respondents did not receive any opioids at all, and one in six were prescribed opioids on only one occasion, indicating that most CMSP patients handle their pain without opioids. Overall, our hypothesis of less filled prescriptions of opioids to the Sami compared to the non-Sami reporting CMSP was not supported. The overall similar prescription of opioid among the Sami and the non-Sami is reassuring and might have several explanations. The Sami and the non-Sami in our study come from the same municipalities and hence have equal access to health care services. Although it has been speculated that the Sami and the non-Sami express chronic pain in different ways to the physician and hence receive different treatments, our results do not support this. At least, it is not evident that it has led to differences in prescribing opioids. Furthermore, national guidelines urge restrictive prescriptions of opioids for patients with chronic pain and stress that opioids should be used with the utmost care [41]. The guidelines in Norway have been stable over time, and in line with guidelines in other Nordic countries. In Canada, new and more strict guidelines was released and implemented in 2017. These guidelines are more in line with the Norwegian guidelines, urging alternative non-opioid medications as first-line options for chronic pain [42]. It has been argued that there are several factors contributing to the relatively low and stable use of opioids in Norway and other Nordic countries compared to Canada and the U.S, including access to health care services almost free of charge, strong health institutions, universally available systems for social welfare and low socio-economic disparities [43–45]. A study found that state policies was associated with reduced misuse of opioid prescriptions [22]. It should be noted that comparison between countries are difficult as the Nordic countries have national prescription databases with accurate data on filled opioid prescriptions, while for instance, in Canada, population-based prescriptions data is not available for all provinces and territories [46].

Receiving only one prescription of opioids might indicate a one-time incident of acute pain, such as after undergoing surgery or other incidents. The result that 80–85% did not receive any opioids during a year and that only 1–3% received > 180 DDD of opioids agrees with a study from the Nord-Trøndelag Health Study (HUNT) and the NorPD, which found that 85% of those reporting chronic non-malignant pain did not use opioids at all and that 3% used opioids persistently (prescriptions in at least 3 of 4 quarters of the year with in total > 180 DDD) [47]. Data from the HUNT Study were collected from 2006 to 2008 and was followed up prospectively for three years. Consistent with our results from 2012–2019, this might imply that the trend in opioid use is relatively stable. In a study by Breivik et al. [3] from 2006, a far lower percentage (21%) than that in our study reported that they had never taken a prescription medication for their chronic pain. However, in the latter study, use of prescription medication was self-reported, and the sampling and methodology were different. The most common reason for not receiving any treatment for their chronic pain was that the respondents could manage the pain on their own or that the pain was not particularly severe. Many reported that they disliked taking medication. Over one-third of respondents also worried about becoming addicted to pain medication, and two-thirds were concerned about other side effects [3]. These reasons might also be relevant to our respondents.

Some of the studies that have found ethnic differences in opioid prescriptions have argued that such perceived differences are not due to ethnicity per se but rather to poorer social conditions and poor access to health care services among minority patients [33]. Studies have been conducted in emergency departments, mainly in the U.S., where there are large differences in socioeconomic status and access to health care services across ethnic groups. For example, a higher proportion of African Americans, Hispanics and Indigenous populations are living in poverty than whites [33,48]. In contrast, studies have found small socioeconomic differences between the Sami and the non-Sami in Norway [48,49], and access to health care services is mainly free of charge and accessible to all Norwegian residents. This might explain the finding of no overall significant ethnic differences in the filled prescriptions of opioids in this study. The statistically significant ethnic difference in opioid prescription we observed between Sami and non-Sami women in 2019 was due to a difference in whether low doses were received in one versus two or more prescriptions. Therefore, we do not place much emphasis on this finding.

Strengths and limitations

A major strength of our study is the prospective and accurate measurement of drug prescriptions and dispensation from a national register. NorPD provides accurate data on the dispensed volume of opioids and allows longitudinal analyses at the individual level. The question measuring CMSP is consistent with the International Association for the Study of Pain's (IASAP) definition of chronic pain: pain that has lasted for at least ≥3 months, which strengthens the validity of the study.

One major limitation of this study is the low participation rate, which most likely introduced selection bias. Therefore, estimates of opioid use must be interpreted with caution. The information concerning non-respondents is sparse other than that the participation rate increased with age and female gender [50]. Whether there are ethnic differences in participation rates cannot be determined, as ethnicity is not recorded in any official register in Norway. Misclassification of ethnicity might have introduced bias. Misclassification of the non-Sami into the Sami group is unlikely. However, misclassification of the Sami into the non-Sami group is possible. There is no consensus on how to define Sami ethnicity, and different researchers use different criteria. Hence, some of the respondents defined as non-Sami in our study might be defined as Sami with another definition. A long history of national assimilation policy has led to a loss of language and culture among the Sami, and respondents may hide their Sami ethnicity due to stigma. In our study, participants had to consider themselves Sami in order to be categorised as Sami. This means that many of the subjects categorised as non-Sami have Sami ancestry. Nevertheless, we strongly believe that self-identification is the best and most ethical way to define ethnic belonging, also supported by the ILO Convention number 169, article 1 [51]. The possible misclassification of ethnicity is probably non-differential, and any possible association between ethnicity and the use of opioids might be attenuated.

The municipalities included in this study were selected due to their high number or proportion of Sami inhabitants, and they cover a large part of the main, traditional Sami settlement areas in Norway. The results cannot necessarily be generalised to the entire Sami and non-Sami populations of Norway.

A limitation is that we only have used DDD to measure redeemed opioids, and not oral morphine milligram equivalent dose (OMEQ). It is recommended to use both systems in the same study, but DDD was only available in our dataset. Further, it is a limitation that filled prescriptions of strong opioids could not be analysed separately for each year, due to a low use of strong opioids. Another weakness is that the information from the NorPD contains only filled prescriptions, and it is impossible to know whether the opioids were taken. Furthermore, we do not have information on the indications. However, we excluded participants who received opioid prescriptions due to palliative care, which is a common cause of receiving opioids. We also excluded participants who had died or emigrated. However, data on emigration was only available for up to 2017, but since very few people emigrate, this is regarded as of minor importance. The participants reported chronic pain only at baseline in 2012, and we have no information about whether the pain persisted throughout the follow-up period. Possible new chronic pain patients among SAMINOR 2 participants during the follow-up period were not included in the analyses.

Another limitation is that this study does not capture illicit drug use. A recent study over overdose deaths in Norway shows that there has been a shift from heroin to opioid related overdose deaths [52,53] The authors states that it is possible that the at-risk-population now is older and potentially dominated by patients in treatment for chronic pain conditions [52]. Future studies should put a greater emphasise on this group.

Conclusion

Sami and non-Sami reporting CMSP received similar amounts of opioids, and the amounts were stable over time. About half of the respondents did not use any opioids at all during the eight calendar years analysed. Based on our results, there is no indication of unequal prescriptions to the Sami versus the non-Sami population, and no need to be concerned regarding opioid use in this population in general. However, a small group (<1% of the CMSP respondents) used very high doses every year. Better follow-up of long-term users should be prioritised, regardless of their ethnic background.

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No potential conflict of interest was reported by the author(s).

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Data availability statement

Data is stored at Services for sensitive data (TSD). The data underlying this article cannot be shared publicly due to the ethical and legal contract with the Regional Committee for Medical and Health Research Ethics (REK-Sør-Øst, number 23,394), the SAMINOR Project Board, UiT the Arctic University of Norway, the Norwegian Centre for Research Data (NSD), Statistics Norway (SSB) and the Norwegian Prescription Database (NorPD).

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