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ORIGINAL ARTICLE

Depression and anxiety in the reindeer-herding Sami population of Sweden

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ABSTRACT

Objectives. The objective of this study was to investigate symptoms and predicting factors of depression and anxiety among reindeer-herding Sami in Sweden.

Study design. A total of 319 reindeer-herding Sami (168 men, 151 women) were compared with urban and rural reference populations comprising 1,393 persons (662 men, 731 women).

Methods. A cross-sectional questionnaire study on mental health, which included the Hospital Anxiety and Depression Scale (HADS). Data were analysed with regard to population, gender, age group, education and work-related stress.

Results. The Sami population disclosed higher mean values for both depression and anxiety than the reference groups, with Sami men reporting the highest rates. Work-related stress was associated with anxiety and depression in the Sami group.

Conclusions. By comparing Sami men and women with reference groups of men and women living in urban and rural areas in northern Sweden, this study identified that reindeer-herding Sami men require special attention with regard to mental health problems.

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Keywords: depression, anxiety, Sami, reindeer herding, Sweden

INTRODUCTION

The Sami have been living in the northern part of Scandinavia, *Såpmi*, since the first recorded history of human life in the region (1). Thus, they are the Indigenous population of this region. *Såpmi*, the geographic area traditionally populated by the Sami, extends today across the borders of Sweden, Norway, Finland and Russia.

The health situation for Indigenous peoples in the circumpolar regions has for several years attracted the attention of researchers from many parts of the world. Most commonly, the Indigenous groups have been identified with higher suicide rates, greater substance abuse and poorer psychosocial and somatic health compared to other populations (2–4). These facts are mainly explained by the complex processes of acculturation and discrimination (5–7).

The Sami population has never been a homogenous group regarding religion, traditions or language. In the Swedish part of *Såpmi*, reindeers were traditionally closely connected to Sami culture because they were fundamental resources for food, material for clothing, tools, transportation and handicraft (8). The recent development towards a money-based economy (instead of self-sufficiency) has changed the conditions for herding, as did the colonization of *Såpmi* by Nordic non-Sami. The Swedish government has legislated Sami affairs and reindeer husbandry by regulating who is allowed to manage reindeer herding and defining the number of reindeers they can herd. Conflicts have arisen in the region on several levels. There are conflicts between Sami groups and landowners and between Sami groups and the Swedish government. There are also conflicts both within the small

Sami communities and between different Sami communities (9). Recent research has shown that because the reindeer herders do not consider herding as a normal job, rather a way of life as a Sami, possible thoughts of leaving the difficulties of reindeer herding for another occupation are vague and not considered a real option. It has been proposed that this view stems not only from an awareness of responsibility to Sami culture but also to the Sami as an individual (10). It is reasonable to assume that this development of occupational identity has consequences when handling occupational stress.

Current research on Sami health

Swedish and Norwegian researchers have conducted most research on Sami health. There is a substantial body of common knowledge concerning the strained and stigmatized living situation of the reindeer-herding Sami population, but from a scientific point of view we know very little about their mental health (11). Research has shown that the psychosocial work situation for many reindeer-herding Sami is characterized by a difficult financial situation, little hope for the future, high demands, little control and a low level of social support (12,13). The conclusions of these recent Swedish studies are that reindeer-herding men and women might require different approaches in mental health services.

Previous research on the Sami population (both data base research and school surveys) presents a uniquely positive situation regarding their overall health compared to other Indigenous peoples. This lack of research on the mental health situation of the Swedish reindeer-herding Sami population was the motivation behind the current study.

The first aim of the study was to assess the prevalence of symptoms of depression and anxiety, respectively, among the Sami population compared to geographically matched groups. A second aim was to identify factors influencing levels of anxiety and depression in the Sami group – factors such as age, gender, education, alcohol use and work-related stress.

The present study forms part of a larger project examining the psychosocial and mental health situations of reindeer-herding Sami in Sweden.

MATERIAL AND METHODS

The study was designed as a cross-sectional investigation of symptoms of anxiety and depression in a reindeer-herding population and a geographically matched reference group.

Population

The target population was Swedish reindeer-herding Sami aged 18 years and older, defined as members of one of the 42 Sami communities (*samebyar* in Swedish), in total comprising about 2,000 people earning a living partly from reindeer herding (14). Sami communities are virtual administrative organizations and not villages in a physical sense. A reference group of 2,000 persons aged 18–74 living in the same geographic area was randomly selected. Since the Swedish reindeer herders reside in rural areas all over northern Sweden as well as in different communities because of their semi-nomadic lifestyle, it was decided to use both urban and rural dwellers as reference group. “Urban” was defined as living in one of the major cities of northern Sweden, and “rural” as living in a community in the core Sami area.

Instruments

The study was performed using a questionnaire of altogether 9 instruments, each comprising 3 to 14 questions. The questionnaire was tested and evaluated in a pilot study in close collaboration with 1 Sami village. In addition to basic sociodemographic characteristics (gender, age, education), the instruments covered areas such as work strain, alcohol consumption, depression, anxiety and suicidal behaviour. The major instrument discussed in this paper is the Hospital Anxiety and Depression Scale (HADS). HADS is a widely used and well-validated 14-item, self-rating instrument covering the core symptoms of depression (HADS-D) and generalized anxiety (HADS-A) (15,16). Each scale constitutes a 4-point ordinal scale describing symptom severity. The suggested ranges for the scores are 0–7 normal, 8–10 mild disorder, 11–14 moderate disorder and 15–21 severe disorder (17). Although HADS was originally designed to identify cases of anxiety disorders and depression among patients in non-psychiatric hospital clinics, the questionnaire also performs well in assessing the symptom severity among the general population (15). HADS has also been used as a continuous scale for mean values (18). The Alcohol Use Disorder Identification Test (AUDIT) (19,20) was used to measure alcohol risk consumption. AUDIT is a similarly well-validated test (20,21); the cut-off points used in the study were ≥ 6 and ≥ 14 for women and ≥ 8 and ≥ 16 for men, indicating risk consumption and hazardous consumption, respectively. Further, work-related psychological stress was measured using Karasek’s demand-control model (22,23), with 11 questions that had 4 response alternatives ranging from “never” to “almost

always.” After calculating the demand-control ratio, the index was stratified into a 7-grade scale for regression analysis.

Procedure

Because of the practical obstacles in reaching the Sami reindeer-herding population, the procedure chosen was to ask the chairperson of every Sami village to distribute the questionnaires to his/her members. According to information from the village chairs, they were able to reach out to 640 persons. The questionnaires were to be returned by post to the research group in prepaid envelopes. A total of 319 questionnaires were returned during 2007. For the reference group of 2,000 persons, postal questionnaires were distributed during the same period, with 2 reminders. A total of 1,393 questionnaires were returned.

Statistical analysis

For descriptive comparative statistics, we used the chi-square Fisher's Exact Test and Mann-Whitney U-test. Logistic regression (with forward regression) was used to explore within-model determinants of depression and anxiety. Determinants were population (Sami, urban, rural), gender, age group (18–29, 30–49, ≥50 years), alcohol risk consumption (1–3) and work-related stress (1–7). All statistics were calculated using SPSS (version 17.0; SPSS Inc., Chicago, IL, USA).

Reliability

The internal consistency of the HADS-A subscale gave a Cronbach's alpha of 0.82 in the Sami population and 0.86 in the reference group. The Cronbach's alpha of the HADS-D subscale was 0.79 in the Sami population and 0.81 in the reference group. Concerning the subscales of the job strain scale, the Cronbach's alpha was 0.64 for

demand and 0.62 for control in the Sami group, while for the reference group the Cronbach's alpha was 0.67 for demand and 0.63 for control. For AUDIT, the Cronbach's alpha was 0.84 for the Sami group and 0.80 for the reference group.

Ethical considerations

The study was approved by the regional research ethics committee in Umeå and followed the guidelines of the Helsinki Declaration. Special consideration was given to the risk of stigmatization in studying a minority group. Our group has had positive experiences of conducting research in collaboration with the Sami organizations, and the results will be presented in dialogue with the Sami group to prevent misunderstandings and stigma. Our opinion is that the risk is small, particularly in relation to the importance of the study.

RESULTS

Sociodemographic characteristics of responding groups

In total, 319 persons (49.8% response rate) responded to the questionnaires distributed to the Sami population; in the reference group, there were 679 urban and 714 rural respondents (69.7% response rate). The group returning the lowest proportion of questionnaires was the youngest group (66.1%). As compared to rural and urban reference groups, a higher proportion of the Sami male respondents was in the age group 30–59 ($p < 0.01$), and as compared to rural, a significantly higher proportion in the age group 18–29 ($p < 0.01$). Among women there was a higher proportion of young respondents in the Sami group than in the rural group ($p < 0.05$).

Due to internal missing values, the quantity of n is differing between different tables. Comparison between different populations showed significant differences in formal education between Sami men and urban men ($p<0.001$) and between Sami women and rural women ($p<0.001$).

Symptoms of depression and anxiety

Significantly higher levels of anxiety were found in the total Sami population as compared to both urban ($p<0.05$) and rural ($p<0.001$) populations.

Sami men reported a significantly higher level of depression than both urban ($p<0.001$)

Table I. Distribution of age, gender and level of formal education in different populations. Percentages presented are based on the number of respondents.

	Sami				Urban				Rural			
	men n=168 n	%	women n=151 n	%	men n=328 n	%	women n=351 n	%	men n=334 n	%	women n=380 n	%
Age												
18-29	25	16.0 ^{ur}	33	22.3 ^r	74	22.6	80	22.8	31	9.3	33	8.7
30-49	78	50.0	63	42.6	119	36.3	117	33.3	99	29.6	125	32.9
≥50	53	34.0	52	35.1	135	41.2	154	43.9	204	61.1	222	58.4
Information missing	12		3		0		0		0		0	
Level of education												
≤9 years	82	49.4	26	17.3	64	19.9	58	16.6	137	41.5	119	31.7
10-12 years	68	41.0	57	38.0	151	46.9	151	43.3	151	45.2	170	45.4
≥13 years	16	9.6 ^{ur}	67	44.7 ^r	107	33.2	140	40.1	42	12.7	86	22.9
Information missing	2		1		6		2		4		5	

^u Statistically significant difference at $p<0.05$ between Sami and urban populations.

^r Statistically significant difference at $p<0.05$ between Sami and rural populations.

Table II. Mean, standard deviation (SD), median (Md) and proportions of symptom severity of depression and anxiety as measured by HAD by different populations and gender.

	Sami				Urban				Rural			
	men n=165	%	women n=149	%	men n=322	%	women n=348	%	men n=324	%	women n=369	%
Depression												
Normal ^a	137	83.0 ^u	131	87.9	289	89.8	307	88.7	288	88.1	334	89.5
Mild disorder ^b	20	12.1	14	9.4	23	7.1	25	7.2	29	8.9	27	7.2
Moderate disorder ^c	5	3.0	4	2.7	6	1.9	13	3.8	8	2.4	9	2.4
Severe disorder ^d	3	1.8	0	0.0	4	1.2	1	0.3	2	0.6	3	0.8
Mean±SD ^e	4.33±3.38		3.74 ±3.95		3.60±3.14		3.34±3.04		3.53±3.13		3.30±3.06	
Md	4 ^{ur}		3 ^u		3		2		3		2	
Anxiety												
Normal ^a	100	61.7 ^{ur}	102	68.5	247	76.9	244	70.1	260	80.2	283	76.7 [*]
Mild disorder ^b	34	21.0	27	18.1	50	15.6	56	16.1	34	10.5	47	12.7
Moderate disorder ^c	25	15.4	11	7.4	20	6.2	34	9.8	24	7.4	30	8.1
Severe disorder ^d	3	1.9	9	6.0	4	1.2	14	4.0	6	1.9	9	2.4
Mean±SD ^e	6.40±3.92		6.11±4.07		4.97±3.65		5.64±4.20		4.31±3.92		4.91±3.96	
Md	6 ^{ur}		5 ^{ur}		4		5		4		4 [*]	

^a Score between 0 and 7.

^b Score between 8 and 10.

^c Score between 11 and 14.

^d Score between 15 and 21.

^e HAD min=0, max=21.

^u Statistically significant difference at $p<0.05$ between Sami and urban populations.

^r Statistically significant difference at $p<0.05$ between Sami and rural populations.

^{*} Statistically significant difference at $p<0.05$ between men and women.

and rural men ($p < 0.01$), as well as a higher level of anxiety ($p < 0.001$) compared to both urban and rural men. The differences between the 3 populations were somewhat smaller for women, where Sami women reported significantly higher scores for anxiety, but only compared to rural women ($p < 0.001$), and a significantly higher level of depression compared to both urban and rural women ($p < 0.05$). The level of depression and anxiety was not significantly different between Sami men and Sami women. Comparisons based on proportions of each population reporting mild to severe symptoms (>7) are presented in Table III.

As a group, the Sami disclosed significantly higher proportions (chi-square) of depression (14.2%) than the urban population (10.8%) ($p < 0.05$), and more anxiety (33.6%) than both the urban (26.6%) ($p < 0.001$) and rural (21.1%) ($p < 0.001$) population (not shown in Table III). Sami men disclosed significantly higher proportions of a mild to severe anxiety

disorder than both urban men ($p < 0.001$) and rural men ($p < 0.001$), and Sami men showed higher proportions of depression than urban men ($p < 0.05$). The prevalence of anxiety was close to significantly higher ($p = 0.052$) among Sami women compared to rural women. Proportions of mild to severe conditions for different age groups showed that Sami men in the age group 30–49 disclosed higher proportions of anxiety than both urban ($p < 0.05$) and rural men ($p < 0.01$) in the same age group. Sami men in the ≥ 50 age group reported more anxiety than urban men in the same age group ($p < 0.05$). Among men with low and medium levels of formal education, Sami men reported higher scores on anxiety than both urban and rural men ($p < 0.01$).

Determinants of depression and anxiety

The results of bivariate analyses of the different populations, and of men and women separately, are shown in Table IV.

Table III. Proportions of mild to severe condition of depression and anxiety by different populations, gender and age groups.

	Sami				Urban				Rural			
	men n=165		women n=149		men n=321		women n=348		men n=324		women n=369	
Depression ^a	n	%	n	%	n	%	n	%	n	%	n	%
All ages	28	17.0 ^u	18	12.1	33	10.2	39	11.2	39	11.9	39	10.5
Age groups												
18-29	3	12.0	6	18.8	5	6.9	7	9.0	1	3.3	3	9.4
30-49	16	21.1	9	14.5	16	13.7	16	13.8	15	15.5	18	14.4
≥ 50	7	13.2	3	5.8	12	9.0	16	10.5	23	11.5	18	8.3
Anxiety ^b												
All ages	62	38.3 ^{ur}	47	31.5	74	23.1	104	29.9	64	19.8	86	23.3 ^s
Age groups												
18-29	11	44.0	17	53.1	21	29.6	35	43.8	7	23.3	16	50.0 ^s
30-49	38	49.4 ^{ur} ^g	20	31.7	37	31.6	39	33.9	29	29.6	35	28.2
≥ 50	12	24.5 ^u	9	17.6	16	12.0	30	19.6	28	14.3	35	16.4

^a Mild to severe depression, (HAD D>7).

^b Mild to severe anxiety (HAD A>7).

^u Statistically significant difference at $p < 0.05$ between Sami and urban populations.

^r Statistically significant difference at $p < 0.05$ between Sami and rural populations.

^g Statistically significant difference at $p < 0.05$ between men and women.

Table IV. Crude and adjusted odds ratios for subjects meeting HAD criteria for mild to severe disorder of depression and anxiety (HAD D>7, HAD A>7), stratified for population and gender.

	Crude OR (CI 95%)	Sami Men OR (CI 95%)	Women OR (CI 95%)	Urban Men OR (CI 95%)	Women OR (CI 95%)	Rural Men OR (CI 95%)	Women OR (CI 95%)
Depression							
Age							
18-29	0.96(0.60-1.53)						
30-49	1.68(1.22-2.31)*						
≥50	1.00						
Alcohol consumption	1.10(1.05-1.13)*	1.11 (1.01-1.22)*	1.29 (1.04-1.60)*	1.09 (1.02-1.17)*	1.09(1.01-1.18)*		
Education							
≤9 years	1.04(0.71-1.55)						
10-12 years	0.94(0.64-1.35)						
≥13 years	1.00						
Job strain ^a	1.99(1.50-2.64)*					3.03(1.40-6.55)*	
Population							
Sami	1.32(0.90-1.94)						
Urban	0.96(0.69-1.53)						
Rural	1.00						
Men	0.13(0.84-1.5)						
Women	1.00						
Anxiety							
Age							
18-29	3.40(2.50-4.63)*			2.45(1.04-6.02)*	2.28(1.06-4.90)*		4.88(1.96-12.11)*
30-49	2.58(2.01-3.32)*			2.73(1.25-5.95)*	2.26(1.11-4.60)*		1.91(1.01-3.63)*
≥50	1.11(1.07-1.14)*						
Alcohol consumption	1.11(1.07-1.14)*		1.38(1.12-1.70)*	1.09(1.02-1.16)*	1.14(1.06-1.23)*	1.09 (1.00-1.17)*	
Education							
≤9 years	0.80(0.59-1.08)						
10-12 years	1.17(0.90-1.52)						
≥13 years	1.00						
Job strain ^a	2.31(1.84-2.89)*	5.18(2.12-12.66)*	2.70(1.22-6.00)*	2.04(1.16-3.57)*	1.87(1.13-3.10)*	3.84(2.02-7.30)*	1.92(1.19-3.11)*
Population							
Sami	1.83(1.38-2.45)*						
Urban	0.31(1.02-1.68)*						
Rural	1.00						
Men	0.87(0.70-1.08)						
Women	1.00						

* Statistically significant at p<0.05 level.

^a Scale 1 to 7.

Among Sami men and women, a high level of depression was significantly associated with alcohol consumption (OR=1.11 and 1.29, respectively), which is a pattern also found among urban men and women. While alcohol consumption was associated with anxiety levels among urban men and women, it was not the case among Sami men or rural women. In the model, work-related stress was identified as predicting anxiety, and for Sami men it was the only factor identified; however, for other groups, a more complex pattern of risk factors was found, including age. For example, younger age was found to be related to the development of anxiety for men and women in urban and rural areas but not in the Sami population. Instead, Sami men's high level of anxiety was significantly associated with work-related stress (OR=5.18).

DISCUSSION

The reindeer-herding Sami population as a group showed more symptoms of anxiety and depression than either the rural or the urban matched reference groups, and the situation was most alarming for Sami men. That these figures are alarming is confirmed when they are compared to other population studies using HADS. A general population in the Norwegian HUNT study (24) showed approximately the same figures as the reference groups in this study, as did a large general population from the Netherlands (18). The strongest factor related to anxiety among Sami men was work-related stress. As the population and culture under study is represented by an occupation (that is gender specific) with many hundreds of years of tradition of working under difficult

circumstances, the results will be interpreted from the perspectives of work situations and gender segregation and in the context of Indigenous peoples. "Mental health" will be used as a synonym for "symptoms of anxiety and depression."

Work health

When interpreting the results in a work-related context, it is important to bring to the fore the basic question of being Sami. Being a reindeer herder, the strongest Sami symbolic act in Swedish Sami culture, means having a natural but exposed position in the Sami community (8). This means that the occupation should not be viewed as "just a job" but also as a position that is important to one's existence as a Sami. Earlier studies on psychological job strain have shown a strong correlation between factors such as control and demands and mental health (25). In detail, previous work has suggested that reindeer herders experience high levels of job demands and difficulties in a society that does not take into account the needs and lifestyle of the Sami reindeer herder (12). The reindeer-herding Sami live under psychologically strenuous conditions and experience conflicts on various levels; in their work, they are dependent on conditions over which they have little or no influence. This is particularly risky for individual reindeer herders because, in most cases, a stressful work situation will not lead to a change of occupation or situation but to mental health problems. These conditions can be summarized into 4 categories: predators (wolves, bears, eagles, wolverines and lynx), extreme weather conditions, financial pressure and conflicts. There are conflicts with landowners, local people and the government about what areas can be used for herding,

conflicts with other Sami villages about land use, conflicts within the Sami community about belonging and conflicts within the Sami community about space, since the number of reindeer is limited by legislation. The changes in managing herding (motorization and larger numbers of reindeer) together with legislation that regulates who has rights to herd are making it more difficult to establish oneself as a herding Sami and to pass this on to the next generation. Thus, the mental health problems found in this study were not unexpected.

Gender perspectives

It has been suggested that there are specific gender roles within the reindeer-herding Sami culture (8), including the masculinization of reindeer herding, which means that as a result of the motorization of herding, there has been an even more apparent gender role orientation. A gender-theoretical analysis is that the small number of Sami women working as herders might distance themselves culturally as Sami women (8). The results of this study can therefore be seen in a context not only of culture norms but also of gender roles. Numerous studies have pointed out that traditional male gender roles may explain the reluctance of men to seek help, arguing that norms of traditional masculinity inhibit emotional expressiveness (26) and also account for the greater occurrence of undetected depression among men than women (27). A traditional masculine gender role, therefore, is dysfunctional because it promotes behaviours that are potentially harmful (28), and men who adhere strongly to the traditional male gender role experience greater psychological distress and depression (29). In addition, generally speaking, men do

not ask friends and family for support in difficult times to the same extent that women do (30). In applying a gender perspective to this study, we also suggest that gender segregation is evident in the fact that Sami women are the highest formally educated group in the region, while Sami men have the lowest formal education (though they are highly trained for their tasks as reindeer herders). This can be related to the management of reindeer herding, with specific tasks for men and women, where the situation almost requires that men do not pursue a higher education while women do, and receiving all the conceivable consequences such as improved social contacts and multiple choices for career development. Altogether, it is reasonable to assume that the gender-specific patterns in Sami society constitute significant risk factors for the development of depression and anxiety among men and women in the Swedish reindeer-herding Sami population.

Indigenous perspective

It is well documented that the Swedish Sami population is more integrated into the main society than many other Indigenous groups (31) and does not show the otherwise typical signs of poorer health (32). Conversely, however, it has been suggested that discrimination and marginalization over the past 60 years has resulted in a lack of understanding by the majority population and that the Sami must defend their ethnic identity in the face of the dominant culture (8,9). Except that these circumstances in other contexts described as having negative effect on mental health, it is also significant that the Swedish health care system (including occupational health care) is not adapted to reindeer herders' specific conditions or the Sami culture.

Methodological considerations

The statistical material represents a possible weakness in this study. Under the circumstances, the response ratio was higher than expected. Generally, such a response rate would be considered unsatisfactory; however, this is a unique study because, for the first time, it approaches this “hard-to-reach group” with questions about depression, anxiety, alcohol consumption and suicidal ideation. Nevertheless, it remains a weakness that we know little about the 321 individuals who received but never returned their questionnaires.

The results might also be influenced by selection bias. Although an over-representation of reindeer herders with mental health problems is possible, based on our personal contacts with Sami villages we have no such indication. Another weakness of the study is the cross-sectional design. Even though it permits identification of important factors associated with symptoms of anxiety and depression, it does not allow us to draw conclusions on causality. One final limitation to consider is that the instruments used were as brief as possible, weakening the validity when using quantitative measures in the aim of exploring the complex relations of work health, mental health and being Sami.

Conclusions

The future of reindeer herding under current legislation places specific demands on young Sami men, and it was among Sami men that we found the highest levels of depression and anxiety. Further research is necessary for a deeper understanding of these mechanisms. This means that, if there is to be Sami reindeer herding in the region, there must be changes in living conditions and mental health serv-

ices for the group: approaches that not only support the exposed individuals but also take long-term political responsibility for the health risks identified.

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