

ORIGINAL RESEARCH

# Disparities in depression at the intersect of Indigenous status and gender in Sweden: a cross-sectional study

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## ABSTRACT

**Introduction:** Depression is a leading cause of disability globally, with disparities evident across gender and ethnicity. Indigenous populations, including the Sámi people in Sweden, face compounded disadvantages due to intersecting social inequalities. This study aimed to estimate the differences in depression prevalence across different intersectional groups defined by Indigenous status and gender in Sweden.

**Methods:** Data on participants (N = 19,839) aged 18–84 years were obtained from two cross-sectional surveys conducted in 2021: the SámiHET study and the Health on Equal Terms (HET) survey. Depression prevalence was assessed using self-reported doctor-diagnosed depression. Four intersectional categories were created representing Sámi women, Sámi men, non-Sámi women, and non-Sámi men. Intersectional disparities (joint, referent, and excess) were estimated to examine the combined effects of Indigenous status and gender on depression prevalence.

**Results:** Sámi women reported the highest prevalence of depression (26%), while Sámi men had the lowest (12%). The joint disparity in depression prevalence was 10 percentage points (pp) (95% CI: 8.4 to 12, adjusted), reflecting a higher prevalence of depression among Sámi women compared with non-Sámi men. Most of the joint disparity was explained by the referent disparities for Indigenous status (-2.6 pp, 95% CI: -4.7 to -0.49) and gender (9.7 pp, 95% CI: 8.5 to 11). The excess intersectional disparity, reflecting the compounded effects of being Indigenous and gender, accounted for a third of the joint disparity (3.3 pp, 95% CI: 0.48 to 6.1, adjusted).

**Conclusion:** Sámi women experienced a disproportionate burden of depression due to intersectional disadvantages. These findings highlight the importance of culturally sensitive mental health strategies and the need for further qualitative research to explore their lived experiences.

**Keywords:** Sámi, depression, intersectionality, inequalities, Indigenous, gender.

Abstract in Español at the end of the article

## INTRODUCTION

Depression is a serious mental health condition affecting approximately 280 million people worldwide [1], making it a leading cause of disability and a major contributor to the global burden of disease [2]. Across Europe, approximately 7% of adults reported living with chronic depression in 2019, with Sweden having the sec-

ond highest prevalence at 11.7% [3].

Previous studies have shown significant differences in the prevalence of depression between different socio-demographic groups. Women often experience higher rates of depression than men due to a combination of stressors [1, 4, 5]. Social and cultural factors, including gender-based violence and discrimination [6–8], and eco-

nomic inequalities, such as poverty and job insecurity [9-11], further increase women's vulnerability to depression.

Research shows that racial and ethnic minorities often experience higher rates of mental health problems, including depression, than the general population [12, 13]. This underscores the need to address the mental health of vulnerable populations, such as Indigenous people, who often experience higher rates of mental disorders due to factors such as deprivation, unemployment, loss of cultural lands and identity, discrimination, and social marginalisation [14-16]. In addition, women tend to be particularly vulnerable to mental illness, experiencing higher rates of depression, psychological distress and suicidal ideation than their male counterparts [17-19]. These mental health inequalities have been exacerbated during crises such as the COVID-19 pandemic [19]. Given the complex mental health challenges faced by Indigenous populations [14, 20, 21], it is therefore crucial to adopt an approach that considers the multiple, overlapping factors that contribute to these disparities.

Intersectionality theory suggests that when multiple social identities, such as race/ethnicity, gender/sex and socioeconomic status, intersect, individuals may experience exacerbated challenges due to the complex interaction between different systems of inequality embedded in society [22]. This theory, originally rooted in the qualitative social sciences, has recently been incorporated into public health to provide a more nuanced understanding of how social factors contribute to health inequalities and to better reflect the complex reality of intertwined inequalities [23].

For example, research using an intersectionality approach has examined the experiences of Indigenous and non-Indigenous parents separated from their children and facing homelessness and mental illness, highlighting how systemic oppression and the interplay of different social identities compound the challenges they face [24]. In addition, research on child sexual abuse among Indigenous Canadians has highlighted how the intersections of ethnicity, gender, and socio-economic status increase their vulnerability [25].

The Sámi people, the only Indigenous population within the European Union, also navigate complex layers of identity and oppression. Their homeland, Sápmi, covers northern Norway, Sweden, Finland, and the Kola Peninsula in Russia. The Sámi demography is unknown, as ethnicity is not recorded in national registers, but it is estimated that there are between 20,000 and 40,000 Sámi in Sweden [26]. Historically, the Sámi population has faced discrimination, cultural and religious oppression, and socio-economic disadvantage [27-29], which may still contribute to mental health problems among Sámi [16].

Research on the mental health of Sámi in Sweden is scarce, but young Sámi [30, 31] and reindeer herders [21, 32] have been found to report worse outcomes than their non-Indigenous peers. A recent study found slightly bet-

ter mental health outcomes among the Sámi compared with the Swedish population [33]. However, Sámi reported higher rates of suicidality, and Sámi women were particularly at risk, with 7.5% reporting lifetime suicide attempts compared with 5.2% of the general Swedish female population [34]. At the same time, other studies have shown that Sámi women are more likely to experience ethnic discrimination [16] and various forms of violence (physical, sexual and psychological) [35], which may explain the increased mental health risks among Sámi women compared to men. However, no studies among Sámi have incorporated nuanced, intersectional approaches investigating the links between Indigenous and gender identities simultaneously on mental health. To bridge this research gap, this study aimed to estimate the differences in depression prevalence across different intersectional groups defined by Indigenous status and gender in Sweden.

## METHODS

### Population and design

This study used data from merging two population-based studies. First, from the SámiHET survey, a comprehensive population-based health study conducted among the Sámi population in Sweden in 2021 [36]. The study also drew from the cross-sectional "Health on Equal Terms" (HET) survey conducted in 2021, a population-based national survey implemented biannually by the Public Health Agency of Sweden [37].

The SámiHET study used three registers to identify Sámi and construct a sample population: the Sámi electoral roll (SER), the reindeer mark register (RMR), and the register of "Labour statistics based on administrative sources" to identify those who reported reindeer husbandry as a source of income. A total of 9,249 persons aged 18-84 were identified. Of these, 3,779 responded to the survey and were included in the study (participation rate 40.9%). A subgroup (n=121) could not clearly identify themselves as Sami and were therefore excluded from the analysis. In total, 3,658 people formed the analytical sample for this study.

The national HET survey sample was drawn from Statistics Sweden's population register: a random sample of 40,000 people was invited to participate, with a participation rate of 44.1%, resulting in 17,578 respondents [37]. Of these, 127 individuals identified themselves as Sámi and were excluded from the analysis, leaving a final analytical sample of 17,221 participants [33]. This national sample constituted the comparison group for the SámiHET study.

The 2021 national HET survey consisted of 66 questions, 10 of which were COVID-19 questions. The questions covered physical and mental health, medication use, contact with health services, dental health, living habits, financial conditions, work and occupation, work environment, safety and social relationships [37]. The SámiHET questionnaire was based on the same questions as the HET survey, but with additional Sámi-

specific sections on access to health care, exposure to violence, discrimination, racism, Sámi identity and language. A total of 81 questions were included [36].

Both surveys were linked to national registers to obtain demographic and socio-economic information such as education, income, economic support, sickness benefits and pensions [33].

## Variables

### Depression

To assess depression, respondents were asked if they had ever been diagnosed with depression by a doctor. Responses were dichotomised as no or yes.

### Intersectional groups by gender and ethnicity

Sámi identity was self-reported, and gender was a registry variable indicating whether the respondent was a man or a woman. No additional information about gender identity was collected. Four intersectional positions were created by cross-classifying the Indigenous and gender variables, reflecting different combinations of social advantages and disadvantages. The categorization was based on predetermined ideas about social status related to indigeneity and gender, which may not necessarily reflect actual health disadvantages: non-Sámi men representing the doubly socially advantaged group, Sámi women representing the doubly disadvantaged group and non-Sámi women and Sámi men, both representing intermediate levels of advantage.

### Covariates

Throughout the analyses, age, marital status, education, and household income were used as covariates. Age was categorized into four groups: 18-29, 30-44, 45-64, and 65-84 years. Marital status was divided into married/cohabiting, unmarried/not cohabiting, divorced, and widow/widower. Education levels were classified as low, medium, and high. Household income was stratified into five quintiles, from lowest to highest.

### Statistical analysis

This study applied the method described by Jackson et al. [38] to analyze intersectional categories. This method estimates the joint disparity on an additive scale between groups that are doubly disadvantaged and those that are doubly advantaged. It then decomposes this joint disparity into components attributable to each individual social position (referent disparity) and the specific intersection of these disadvantages (excess intersectional disparity). This decomposition allows researchers to identify whether the observed disparities are due to individual social factors or to the compounding effect of multiple intersecting disadvantages [38].

In this study, the joint disparity corresponds to the prevalence difference of the outcome between the intersectional groups of double disadvantage (Sámi women) and double advantage (non-Sámi men). The referent disparities represent the differences in prevalence between an intermediate group and the doubly advantaged group. In this study, the referent disparity for

Indigenous status is the difference in depression prevalence between Sámi men and non-Sámi men and thus assessing the disparity among those who are not exposed to gender-based disadvantage. The referent disparity for gender is the difference in depression prevalence between non-Sámi women and non-Sámi men, assessing the gender disparity without Indigenous-based disadvantage.

Finally, the excess intersectional disparity is the difference in prevalence that remains after subtracting both referent disparities from the joint disparity. Thus, the joint disparity is the sum of the two referent disparities plus the excess intersectional disparity.

A joint or referent disparity greater than zero indicates a greater difference in the prevalence of depression among Sámi men, non-Sámi women, or Sámi women compared to non-Sámi men (reference group). A zero estimate for the excess intersectional disparity means that the joint disparity is equal to the sum of the two referent disparities, reflecting an additive effect of Indigenous status and gender on the joint disparity. A positive (or negative) excess intersectional disparity indicates that the prevalence difference among the Sámi women is greater (or smaller) than what would be expected from the independent and additive effects of the two disadvantages.

Generalized linear models with a Gaussian family distribution and an identity link function were used to estimate the four types of disparities. The model was run first on the cross-classified intersectional variable separately for the outcome in unadjusted analysis and then adjusted for the covariates. Each disparity is expressed as prevalence differences, in percentage points (pp.) with its 95% confidence interval for inferential purposes. A quantitative bias analysis was conducted to assess potential selection bias, but no differences were found between the observed and adjusted relative risks. R version 4.2.2 was used for analysis.

### Ethics

The Swedish Ethical Review approved the SámiHET study (Dnr 2020-04803 and Ö 70-2020/3.1) and the merging of data between SámiHET and the national HET surveys (Dnr 2021-06372-02). The Ethical Guidelines for Sámi Health Research were followed [39], and the SámiHET study was carried out on behalf of the Sámi parliament in Sweden.

## RESULTS

Table 1 displays the descriptive statistics for the study population, which included 19,839 participants aged between 18 and 84 years, 46% men and 54% women. Among the intersectional groups, non-Sámi women accounted for 43%, followed by non-Sámi men at 38%, Sámi women at 10%, and Sámi men at 7.9%. Depression prevalence was 19%, being higher among women (24% among non-Sámi women and 26% among Sámi women) than among men (14% and 12% among non-Sámi and Sámi men, respectively).

**Table 1.** Descriptive statistics of the main variables by intersectional group (N = 19,839).

Variable	Sami:Men, N = 1,577	Non- Sami:Men, N = 7,605	Non- Sami:Women, N = 8,602	Sami:Women, N = 2,055
<b>Depression</b>				
No depressed	1,394 (88%)	6,566 (86%)	6,515 (76%)	1,529 (74%)
Depressed	183 (12%)	1,039 (14%)	2,087 (24%)	526 (26%)
<b>Age</b>				
18-29	137 (8.7%)	794 (10%)	1,100 (13%)	226 (11%)
30-44	283 (18%)	1,363 (18%)	1,688 (20%)	477 (23%)
45-64	608 (39%)	2,695 (35%)	3,114 (36%)	787 (38%)
65-84	549 (35%)	2,753 (36%)	2,700 (31%)	565 (27%)
<b>Marital status</b>				
Married/cohabiting	717 (45%)	4,051 (53%)	4,294 (50%)	833 (41%)
Unmarried/not cohabiting	647 (41%)	2,667 (35%)	3,007 (35%)	850 (41%)
Divorced	177 (11%)	886 (12%)	1,300 (15%)	282 (14%)
Widow/er	36 (2.3%)	1 (<0.1%)	1 (<0.1%)	90 (4.4%)
<b>Education</b>				
Low	292 (19%)	2,066 (27%)	2,960 (34%)	746 (36%)
Medium	1,019 (65%)	4,379 (58%)	4,649 (54%)	1,147 (56%)
High	266 (17%)	1,160 (15%)	993 (12%)	162 (7.9%)
<b>Household income</b>	505,710 (416,248)	662,195 (2,641,243)	630,941 (739,442)	499,229 (610,650)

1n (%); Mean (SD)

Regarding marital status, the highest proportion of married or cohabiting individuals was found among the non-Sámi men (53%). On the other hand, unmarried or not cohabiting individuals were most prevalent among Sámi men and women (41%). The majority of participants had a medium level of education, with Sámi men having the highest proportion at 65%, followed by non-Sámi men (58%). In contrast, a larger percentage of women had low educational levels, with 34% of the non-

Sámi women and 36% of the Sámi women belonging to this category (Table 1).

In terms of household income, the non-Sámi men reported the highest mean household income at 662,195 SEK (SD = 2,641,243), followed by the non-Sámi women at 630,941 SEK (SD = 739,442). Sámi men had a mean household income of 505,710 SEK (SD = 416,248), while Sámi women reported the lowest mean household income at 499,229 SEK (SD = 610,650).

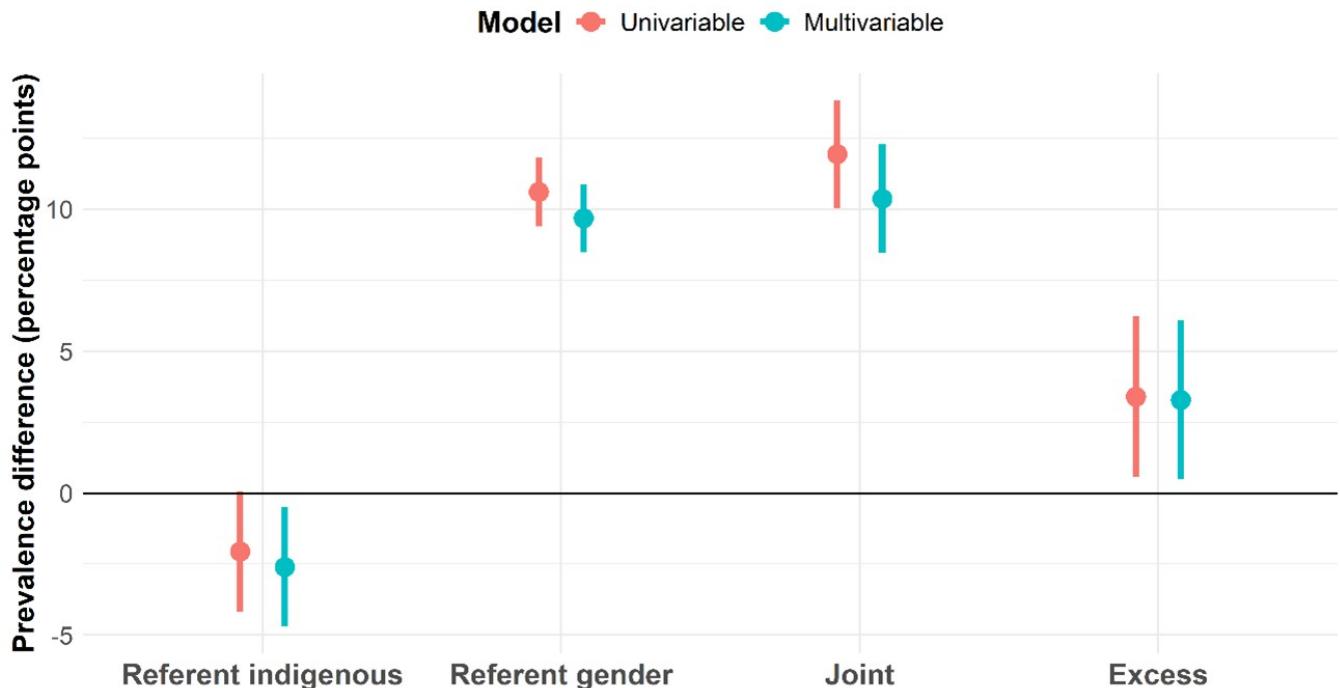
**Table 2.** Unadjusted and adjusted intersectional disparities in the prevalence of depression.

Disparity	Unadjusted Prevalence difference in depression (95% CI)	Adjusted Prevalence difference in depression (95% CI)
Joint	12 (10 to 14)	10 (8.4 to 12)
Referent Indigenous	-2.1 (-4.2 to 0.06)	-2.6 (-4.7 to -0.49)
Referent Gender	11 (9.4 to 12)	9.7 (8.5 to 11)
Excess Intersectional	3.4 (0.56 to 6.2)	3.3 (0.48 to 6.1)

Table 2 and Figure 1 present the unadjusted and adjusted intersectional disparities in the prevalence of depression. The results from both analyses were consistent, suggesting that the findings are robust, even after accounting for potential confounders. The joint disparity in depression prevalence was 10 percentage points (pp) (95% CI: 8.4 to 12) after adjustment, indicating a higher prevalence of depression among Sámi women compared to non-Sámi men.

The decomposition of the joint disparity revealed the referent Indigenous disparity (difference in depression between Sámi men and non-Sámi men) was -2.6 pp (95% CI: -4.7 to -0.49), indicating a lower prevalence of depression among Sámi men. The referent gender disparity, comparing non-Sámi women to non-Sámi men, showed that non-Sámi women had a significantly higher prevalence of depression (9.7 pp; 95% CI: 8.5 to 11).

Additionally, the excess intersectional disparity, the



**Figure 1.** Intersectional disparities in the prevalence of depression in unadjusted and adjusted models for age, marital status, education, and household income.

combined effect of Indigenous status and gender disparities, resulted in a higher prevalence of depression among Sámi women (3.3 pp.; 95% CI: 0.48 to 6.1) than would be expected from considering the sum of the two reference disparities independently.

## DISCUSSION

This study aimed to estimate the differences in depression prevalence across different intersectional groups defined by Indigenous status and gender in Sweden. Substantial differences in self-reported depression were identified between intersectional groups, with Sámi women experiencing the highest prevalence compared to non-Sámi men. These findings should be considered in the context of the COVID-19 pandemic, which coincided with the data collection period. The pandemic intensified mental health challenges among women in marginalized communities [19], possibly contributing to the higher depression rates seen among Sámi women in this study.

The excess intersectional disparities corresponded to one third of the joint disparity, suggesting a compounding effect of indigeneity and gender on mental health outcomes. This highlights how combined factors of social disadvantage exacerbate mental health challenges for Sámi women, leading them to experience a greater mental health burden than what would be expected from considering disadvantages if the disadvantages of being a woman and being Sámi were considered separately.

These results are consistent with other studies that

highlight the mental health challenges faced by Sámi women in terms of depression and anxiety [33]. For instance, La Parra-Casado et al. [16] found that depression was elevated among Sámi women who had experienced direct ethnic discrimination. Other studies have also highlighted gender differences in suicidal behavior among Sámi adolescents, with higher rates of suicidal ideation and attempts among females [40, 41].

These findings align with research on Indigenous populations in other contexts. In Canada, for example, Indigenous women have been shown to face significantly higher rates of depression, anxiety, and trauma-related disorders than non-Indigenous populations, often compounded by experiences of discrimination and violence [42]. Similarly, in Australia, Aboriginal women were more likely to experience severe psychological distress and higher rates of affective disorders than non-Aboriginal women [43].

While new qualitative studies focusing on Sámi women would be useful to understand how the compounded effects are experienced by those affected, a recent report on violence against Sámi women sheds some light on social dynamics that may be relevant. In the report, in which Sámi women most often reported higher exposure to violence than non-Sámi women, Swedish social support systems for women exposed to violence explained the difficulties of addressing gender-based violence against Sámi women in particular. For example, they suggested that the cultural norm of 'being a strong Sámi woman' may be a barrier, as well as loyalty towards Sámi men and Sámi communities, which may

be stigmatized if associated with gender-based violence [35].

The referent Indigenous disparity showed that Sámi men had a lower prevalence of depression than non-Sámi men (-2.6 pp). This result contrasts with previous studies within the reindeer-herding Sámi population, which have shown high rates of depression, suicidal ideation and even suicide mortality, especially among men [21, 32, 44, 45]. However, the reindeer herders are a minority among Sámi in Sweden, and authors have explained their increased psychological distress as related to stressors associated with their livelihoods, including high work demands, financial pressures, high levels of reindeer predation, conflicts over land use, climate change, and the demands of maintaining traditional ways of life that are integral to their cultural identity [21, 46, 47].

Previous studies on Sámi men's mental and behavioral health in general (using the same dataset as in this study) have shown somewhat paradoxical results. Sámi men have reported similar levels of stress and anxiety, less risky alcohol consumption [33], but more lifetime suicidal ideation compared to other men in Sweden [34]. When this is considered in the context of cultural norms of self-reliance, the stigma associated with mental health problems [46, 47], and our measure of depression, which focuses on "having been diagnosed with depression by a doctor", we advise caution before concluding that Sámi men experience a lower burden of depression than other men in Sweden. More research is needed to understand this complex pattern.

In terms of the referent gender disparity, non-Sámi women exhibited a higher prevalence of depression than non-Sámi men. This finding is consistent with studies showing that women generally report higher levels of depression and other mental health problems due to a combination of biological, social, and economic factors [4, 9, 11].

### Methodological considerations

While this study provides important insights into the intersectional disparities in depression prevalence, several methodological considerations should be acknowledged. The application of Jackson et al.'s method for decomposing intersectional disparities is a strength, as it provides a framework for understanding the interplay between Indigenous status and gender in influencing health outcomes. This approach aligns well with intersectionality theory and provides us with valuable insights into the complex ways in which structural factors and systemic inequalities intersect to affect the mental health outcomes for Sámi individuals. However, this method is limited to examining only two social positions at a time. In our study, we chose to focus on gender and Indigenous status, in line with our research question and theoretical framework.

We used a binary gender category (men and women) in this study. It does not account for gender-diverse

individuals, such as non-binary or transgender people. This is a limitation, as gender-diverse populations often face structural and psychosocial stressors that may affect depression outcomes.

In addition, the study's reliance on self-reported doctor-diagnosed depression could be subject to recall bias or underreporting, especially among populations that face cultural and structural barriers to receiving a diagnosis. Furthermore, the relatively low response rate (40.9% for the SámiHET and 44.1% for the national HET survey) may have introduced some selection bias. However, a quantitative bias analysis indicated that the differences between observed and adjusted relative risks were small and did not materially affect our estimates.

As the exact size of the Sámi population in Sweden is unknown, and the Sámi included in the SámiHET are likely to have a stronger Sámi identity (as suggested by their participation in Sámi parliamentary elections or ties to reindeer husbandry), we recommend caution in generalising these findings to the entire Sámi population in Sweden.

### Conclusion

This study employed an intersectional approach to assess depression disparities by Indigenous status and gender in Sweden. The analysis revealed that Sámi women faced a compounding effect from the intersection of indigeneity and gender disadvantage, resulting in a higher prevalence of depression. These findings highlight the importance of recognizing and addressing the unique challenges faced by people with multiple marginalized identities. They also highlight the limitations of traditional approaches that consider social identities in isolation, reinforcing the need for intersectional public health strategies. Based on these findings, culturally sensitive approaches to enhance mental health for Sámi women should be prioritized by public health authorities. In addition, further qualitative studies can play a crucial role in uncovering the unique experiences of the Indigenous-gender intersection in mental health in Sweden.

## DECLARATIONS

### Publication Consent

Not applicable.

### Competing interests

No conflict of interest to declare.

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### Author contributions

JPAS and MSS conceived the original SámiHET study and collected the data. MSS and JPAS formulated the research question. RBA analysed the data supported by OFR and drafted the manuscript. MSS, JPAS and OFR

contributed to the interpretation of the findings and commented on the draft article. All authors approved the final version of the article. JPAS is an Indigenous Sámi.

#### Data availability

The data cannot be shared publicly due to its sensitive nature. It is available from Umeå University (contact the corresponding author for details) to researchers who meet the criteria for accessing confidential data.

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## ABSTRACT IN SPANISH

### Desigualdades en la depresión en la intersección entre la condición de indígena y el género en Suecia: un estudio transversal

**Introducción:** La depresión es una de las principales causas de discapacidad a nivel mundial, con desigualdades evidentes según el género y la etnicidad. Las poblaciones indígenas, incluyendo al pueblo Sámi en Suecia, enfrentan desventajas acumuladas debido a desigualdades sociales interseccionales. Este estudio tuvo como objetivo estimar las diferencias en la prevalencia de depresión entre distintos grupos interseccionales definidos por la condición de indígena y el género en Suecia.

**Métodos:** Se utilizaron datos de participantes (N = 19,839) de entre 18 y 84 años, obtenidos de dos encuestas transversales realizadas en 2021: el estudio SámiHET y la encuesta "Salud en Términos Iguales" (HET). La prevalencia de depresión se evaluó mediante autoinforme del diagnóstico médico de depresión. Se crearon cuatro categorías interseccionales que representaban a mujeres Sámi, hombres Sámi, mujeres no Sámi y hombres no Sámi. Se estimaron desigualdades interseccionales (conjuntas, de referencia y excedentes) para examinar los efectos combinados de la condición de indígena y el género sobre la prevalencia de depresión.

**Resultados:** Las mujeres Sámi reportaron la mayor prevalencia de depresión (26%), mientras que los hombres Sámi presentaron la menor (12%). La desigualdad conjunta en la prevalencia de depresión fue de 10 puntos porcentuales (pp) (IC del 95%: 8.4 a 12, ajustado), lo que refleja una mayor prevalencia de depresión entre las mujeres Sámi en comparación con los hombres no Sámi. La mayor parte de esta desigualdad conjunta se explicó por las desigualdades de referencia relacionadas con la condición de indígena (-2.6 pp, IC del 95%: -4.7 a -0.49) y el género (9.7 pp, IC del 95%: 8.5 a 11). La desigualdad interseccional excedente, que refleja los efectos acumulativos de ser indígena y del género, representó un tercio de la desigualdad conjunta (3.3 pp, IC del 95%: 0.48 a 6.1, ajustado).

**Conclusión:** Las mujeres Sámi experimentaron una carga desproporcionada de depresión debido a desventajas interseccionales. Estos hallazgos subrayan la importancia de estrategias de salud mental culturalmente sensibles y la necesidad de realizar investigaciones cualitativas adicionales que exploren sus experiencias vividas.

**Palabras clave:** Sámi, depresión, interseccionalidad, desigualdades, Indígena, género.

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