

## Prevalence of Anxiety, Depression and Social Support Networks in HIV/AIDS Patients: A Cross-Sectional Study

### *Prevalencia de ansiedad, depresión y redes de apoyo social en pacientes con VIH/SIDA: estudio transversal*

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#### Summary

**Objective:** to determine the prevalence of anxiety, depression, and identify social support networks in patients with HIV/AIDS during the COVID-19 pandemic, in a second-level Hospital of the Mexican Institute of Social Security (IMSS). **Methods:** cross-sectional analytical study, 420 HIV-positive patients who attended the HIV Clinic of the GRH No.1 Vicente Guerrero, in Acapulco, Mexico, from October 2021 to February 2022. A sociodemographic questionnaire was applied to obtain general information, the Gráffar-Méndez Castellanos scale, the Hospital Anxiety and Depression Scale (HADS), and the Duke-UNC-11 functional social support questionnaire. Descriptive statistics, bivariate analysis, and logistic regression by the Mantel-Haenszel process were performed with the data obtained. **Results:** the prevalence of anxiety was 7.1%, and depression 5.2%. 89% of the patients perceived to have sufficient total social support. An association between depression, and CD4 lymphocyte count  $<500$  cells/mm<sup>3</sup> (ORa 2.54, 95% CI 1.06-6.12) was found, as well as, insufficient perceived total social support (ORa 15.98, 95% CI 7.68-33.22). Conclusion: Nine out of ten patients perceived to have sufficient total social support, which may be related to the low prevalence of anxiety and depression. CD4 T lymphocyte counts below 500 cells/mm<sup>3</sup> were associated with depression. Social support strategies and adherence to antiretroviral treatment are key to the well-being of the population living with HIV/AIDS during, and in the new normality of the COVID-19 pandemic.

**Key words:** Anxiety; Depression; Social Support; HIV; COVID-19.

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## Resumen

**Objetivo:** determinar la prevalencia de ansiedad, depresión e identificar las redes de apoyo social en pacientes con VIH/SIDA durante la pandemia por COVID-19, en un hospital de segundo nivel del Instituto Mexicano del Seguro Social (IMSS). **Métodos:** estudio transversal analítico, participaron 420 pacientes VIH-positivos que acudieron a la Clínica de VIH del Hospital General Regional No.1 Vicente Guerrero, en Acapulco, México, de octubre 2021 a febrero 2022. Se aplicó una cédula sociodemográfica para obtener información general, la escala de Gráffar-Méndez Castellanos, escala hospitalaria de ansiedad y depresión (HADS) y el cuestionario de apoyo social funcional de Duke-UNC-11. Con los datos obtenidos se realizó estadística descriptiva, análisis bivariado y regresión logística mediante Mantel-Haenszel. **Resultados:** la prevalencia de ansiedad fue 7.1% y depresión 5.2%. 89% de los pacientes percibió tener suficiente apoyo social total. Se encontró asociación entre depresión y recuento de linfocitos CD4 <500 células/mm<sup>3</sup> (ORA 2.54, IC 95% 1.06-6.12), así como apoyo social total percibido insuficiente (ORA 15.98, IC 95% 7.68-33.22). **Conclusión:** nueve de cada diez pacientes percibió tener suficiente apoyo social total, lo cual puede tener relación con la baja prevalencia de ansiedad y depresión. Los conteos de linfocitos T CD4 por debajo 500 células/mm<sup>3</sup> se asoció a presentar depresión. Las estrategias de apoyo social y el apego al tratamiento antirretroviral constituyen una pieza clave para el bienestar de la población que vive con VIH/SIDA durante y en la nueva normalidad de la pandemia de la COVID-19.

**Palabras clave:** ansiedad, depresión, apoyo social, VIH, COVID-19.

## Introduction

The human immunodeficiency virus (HIV) is one of the infectious agents with the greatest impact in the world. According to the 2022 statistics, the United Nations Program on HIV/AIDS (UNAIDS) reported 39,000,000 individuals with HIV worldwide.<sup>1</sup> In Latin America, the World Health Organization (WHO) estimated 2,100,000 cases.<sup>1,2</sup> Mexico reported an HIV prevalence of 0.26%, that is, 3 out of every 1,000 people had HIV.<sup>1</sup> The Mexican states with the highest incidence were: Quintana Roo with 55.2 cases per 100,000 inhabitants, Campeche with 38.8, Yucatán 31.1, Colima 30.5, Baja California Sur 23.1, Veracruz 22.6, Tabasco 22.0, Baja California 20.9, Morelos 19.2, and Guerrero 17.0.<sup>3</sup>

The COVID-19 pandemic may have had a negative impact on the mental health of HIV patients due to the loss of functioning, demoralization, and helplessness they may have experienced; in addition to the economic, social, and psychological implications.<sup>4</sup>

During pandemics, there are multiple alterations associated at the individual, and community level; among them, anxiety and depression can be up to three times more frequent.<sup>5-9</sup>

Depression is one of the main psychiatric comorbidities that can occur during HIV infection, with a prevalence ranging from 18% to 81%, depending on the instrument applied, and the studied population.<sup>10</sup>

It has been observed that anxiety and depression decrease the efficacy of the immune system, making HIV patients more susceptible to opportunistic infections.<sup>11</sup> A neuropsychiatric evaluation is pertinent, which requires a clinical history, a complete mental examination, and the use of elements of a neuropsychological evaluation.<sup>12</sup>

The presence of social support in people living with HIV can provide benefits to the patient, because it facilitates their psychosocial adjustment to the disease, and provides a better quality of life due to the help they receive from their support networks (in the form of family, friends, partners, among others); this leads to better physical, and mental health conditions due to the emotional and material resources they obtain from these relationships.<sup>13</sup>

The learning that HIV generated during the COVID-19 pandemic should be considered in order to anticipate needs, with respect to the inequity in health caused by the sociodemographic conditions of people suffering from this disease, with the purpose of generating an environment that promotes and guides changes in habits, abate stigmas, and reinforce multidisciplinary work.<sup>14</sup>

Given the interrelationship of the above factors, the objective of this research was to determine the prevalence of anxiety and depression, and to identify the social support networks in patients with HIV/AIDS during the COVID-19 pandemic in a second-level hospital.

## Methods

Cross-sectional analytical study, conducted at the HIV Clinic of the General Regional Hospital (GRH) No.1 "Vicente Guerrero" of the IMSS, in Acapulco, Mexico, from October 1, 2021, to February 28, 2022. Non-probabilistic sampling by convenience, 420 HIV/AIDS patients with diagnosis confirmed by the Western Blot test participated, and who attended the clinic, monthly or quarterly, for evaluation. The formula for calculating sample size was used to estimate a proportion in finite populations with a confidence level of 95%, and a margin of error of 5%.

The following criteria was used to select participants: active IMSS patients, who attended monthly or quarterly, the outpatient HIV clinic, both genders, between 18 and 80 years of age, with a confirmed diagnosis in the electronic HIV/AIDS clinical record, with viral load, and CD4 count of less than 12 months, and who agreed to participate in the study by signing the informed consent form. Patients with incomplete questionnaires or without a laboratory report of less than 12 months were eliminated.

A questionnaire designed, and filled out by the investigators was used to collect sociodemographic and health information (age, gender, marital status, education, occupation, sexual preference, time of evolution of HIV/AIDS, comorbidities, and medical treatment). Laboratory parameters were collected to obtain viral load, and the CD4 lymphocyte count for the last twelve months.

Socioeconomic level was categorized using the Gráffar-Méndez Castellanos scale.<sup>15</sup> In the last seven days, the Hospital Anxiety and Depression Scale (HADS) was used to evaluate cognitive and behavioral symptoms, in patients with various chronic conditions, including HIV. It is a self-assessment instrument used in individuals who regularly attend the hospital, and therefore constitutes a tool for the detection of psychological distress in the sick population (in comparison with the rest of the self-applied scales in the area). It is made up of fourteen items, integrated by two subscales with seven items each. The items are scored on a Likert frequency scale of 4 response options, ranging from absent or minimal presence= 0, to maximum presence= 3 points, the score of each subscale varies between 0 and 21. The depression (even items) and anxiety (odd items) subscales of HADS are interpreted according to the following score in both cases: 0-7 points (normal or absence of morbidity), 8-10 points (borderline) and >10 points (presence of morbidity). Cronbach's alpha coefficient for different versions varies from 0.81 to 0.90. The sensitivity and specificity values obtained are greater than 0.80.<sup>16,17</sup> Finally, the Duke-UNC-11 functional social support questionnaire was used to assess social support networks.<sup>18</sup>

The CIETMAP 2.1 statistical package was used for data analysis.<sup>19</sup> Descriptive statistics were performed using frequencies and percentages, stratified by gender. Using Mantel-Haenszel,<sup>20</sup> Odds Ratio (OR), and 95% confidence intervals (95% CI) were calculated with the Miettinen procedure.<sup>21</sup> Logistic regression was performed, including the variables that showed a significant association, in the bivariate analysis with anxiety and depression.

The research project was approved by the Local Research Committee and complied the current IMSS regulations.

## Results

A total of 420 patients were surveyed, 91.4% (n= 384) were male, the remaining percentage female. The median age was 33 years, interquartile range 12 years (28-40). 86.2% (n= 362) reported receiving an economic income from their work activity, 63.8% (n= 268) reported being single, and 82.4% (n=346) were in high school or higher. The description of the sociodemographic characteristics is presented in Table 1.

**Table 1. Distribution of Sociodemographic Variables Stratified by Gender in Patients Diagnosed With HIV/AIDS**

Variable	Male	Female	Total
	% (Frequency)	% (Frequency)	% (Frequency)
<b>Age Group</b>			
18-30 years	42.7 (164)	41.7 (15)	42.6 (179)
31-40 years	31.2 (120)	47.2 (17)	32.6 (137)
41-50 years	20.1 (77)	5.6 (2)	18.8 (79)
51-60 years	6.0 (23)	5.6 (2)	6.0 (25)
<b>Employment</b>			
Household	1.8 (7)	19.4 (7)	3.3 (14)
Student	10.2 (39)	0 (0)	9.3 (39)
Employee	46.9 (180)	33.3 (12)	45.7 (192)
Merchant	13.3 (51)	11.1 (4)	13.1 (55)
Professional employee	26.6 (102)	36.1 (13)	27.4 (115)
Unemployed	1.3 (5)	0 (0)	1.2 (5)
<b>Marital Status</b>			
Single	65.1 (250)	50.0 (18)	63.8 (268)
Married	15.1 (58)	25.0 (9)	16.0 (67)
Free Union	18.8 (72)	13.9 (5)	18.3 (77)
Widow/er	0 (0)	8.3 (3)	0.7 (3)
Divorced/Separated	1.0 (4)	2.8 (1)	1.2 (5)
<b>Level of Education</b>			
Elementary	4.2 (16)	11.1 (4)	4.8 (20)
Junior High	13.3 (51)	8.3 (3)	12.9 (54)
High School	33.9 (130)	22.2 (8)	32.9 (138)
Bachelor's Degree	46.9 (180)	58.3 (21)	47.9 (201)
Graduate Degree	1.8 (7)	0 (0)	1.7 (7)
<b>Socioeconomic Level</b>			
High class	1.8 (7)	0 (0)	1.7 (7)
Upper middle class	8.1 (31)	16.7 (6)	8.8 (37)
Lower middle class	29.4 (113)	22.2 (8)	28.8 (121)
Worker class	53.4 (205)	55.6 (20)	53.6 (225)
Marginal class	7.3 (28)	5.6 (2)	7.1 (30)

Regarding sexual preference, more than half of the respondents reported being homosexual 52.2% (n= 219); 49.5% (n= 208) mentioned having an HIV/AIDS diagnosis confirmation from one to five years; based on WHO clinical and immunological criteria, 94% (n= 394) were asymptomatic; 83% (n= 350) denied having any associated comorbidity, and 99% (n= 415) received medical

treatment. According to the laboratory results of the last twelve months, 91.7% (n= 385) had an undetectable viral load; while 19.3% (n= 81) of the participants had CD4 T-lymphocyte levels <500 cells/mm<sup>3</sup> (Table 2).

In relation to the perception of total social support, for 89% (n= 374) of the participants it was sufficient, and for 11% (n= 46) insufficient, 86.7%

(n= 364) referred having sufficient confidential support, and 13.3% (n= 56) insufficient confidential support, 76.9% (n= 323) sufficient affective resources, and 23.1% (n= 97) insufficient.

According to the HADS scale it was found a prevalence of anxiety of 7.1% (n= 30), borderline anxiety 31.9% (n= 134), and absence of anxiety 61.0% (n= 256); while 5.2% (n= 22) of the respon-

**Table 2. Clinical Variables and Biochemical Tests in Patients Stratified by Gender**

Variable	Men	Women	Total
	% (Frequency)	% (Frequency)	% (Frequency)
<b>Sexual Preference</b>			
Heterosexual	20.8 (80)	91.6 (33)	26.9 (113)
Homosexual	56.2 (216)	8.4 (3)	52.2 (219)
Bisexual	21.4 (82)	0 (0)	19.5 (82)
Transsexual	1.6 (6)	0 (0)	1.4 (6)
<b>Time of evolution of HIV/AIDS</b>			
1 to 5 years	49.5 (190)	50.0 (18)	49.5 (208)
6 to 10 years	35.9 (138)	36.1 (13)	36.0 (151)
11 to 15 years	12.8 (49)	8.3 (3)	12.4 (52)
16 to 20 years	0.5 (2)	5.6 (2)	1.0 (4)
>20 years	1.3 (5)	0 (0)	1.2 (5)
<b>WHO Clinical and Immunological Classification</b>			
Asymptomatic	94.5 (363)	86.1 (31)	93.8 (394)
Mild symptoms	5.5 (21)	13.9 (5)	6.2 (26)
Comorbidities			
Diabetes mellitus	8.1 (31)	8.3 (3)	8.1 (34)
Arterial Hypertension	6.8 (26)	2.8 (1)	6.4 (27)
Chronic Kidney Disease	1.0 (4)	0 (0)	1.0 (4)
Tuberculosis	0.8 (3)	5.6 (2)	1.2 (5)
None	83.3 (320)	83.3 (30)	83.3 (350)
<b>Medical Treatment</b>			
Yes	98.7 (379)	100 (36)	98.8 (415)
No	1.3 (5)	0 (0)	1.2 (5)
<b>Viral Load</b>			
Undetectable (<50 copies/ml).	91.4 (351)	94.4 (34)	91.7 (385)
Not detectable (>10 000 copies/ml)	8.6 (33)	5.6 (2)	8.3 (35)
<b>CD4 Lymphocyte Count</b>			
<500 cells/mm <sup>3</sup>	19.5 (75)	16.7 (6)	19.3 (81)
>500 cells/mm <sup>3</sup>	80.5 (309)	83.3 (30)	80.7 (339)

dents presented depression, 32.1% (n= 135) borderline depression, and 62.6% (n= 263) absence of depression.

In bivariate analysis, insufficient total perceived social support was associated with the presence of anxiety and

depression, while CD4 count <500 cells/mm<sup>3</sup> was associated with the presence of depression in patients with HIV/AIDS diagnosis (Table 3 and 4).

In the logistic regression analysis, an R-squared value of 0.32, and adjusted

R-squared of 0.30 were obtained, with an F-statistic of 13.14, with which the performance of the multivariate model was evaluated. The factors insufficient perceived total social support and CD4 lymphocyte count <500 cells/mm<sup>3</sup>

**Table 3. Bivariate Analysis of Factors Associated With the Presence of Anxiety in Patients Diagnosed With HIV/AIDS**

Variable	Anxiety		ORna <sup>1</sup>	CI 95% <sup>2</sup>	p Value
	Sí	No			
<b>Marital Status</b>					
Without marital cohabitation	21	255	1.24	0.55-2.77	0.60
In conjugal cohabitation	9	135			
<b>Socioeconomic Level</b>					
Worker and marginal class	15	240	0.62	0.30-1.31	0.21
Middle and high class	15	150			
<b>CD4 lymphocyte count</b>					
<500 cells/mm <sup>3</sup>	9	72	1.89	0.84-4.26	0.12
>500 cells/mm <sup>3</sup>	21	318			
<b>Total Social Support Perceived</b>					
Insufficient	15	31	11.58	5.89-22.77	0.00
Sufficient	15	359			
<b>Sexual Preference</b>					
Not heterosexual	24	283	1.51	0.60-3.78	0.37
Heterosexual	6	107			

<sup>1</sup>ORna: Unadjusted Odds Ratio, <sup>2</sup> CI 95%: Miettinen Confidence Interval of 95%.

**Table 4. Bivariate Analysis of Factors Associated With the Presence of Depression in Patients Diagnosed With HIV/AIDS**

Variable	Depression		ORna <sup>1</sup>	CI 95% <sup>2</sup>	p Value
	Yes	No			
<b>Marital Status</b>					
Without marital cohabitation	15	261	1.12	0.45-2.83	0.80
In conjugal cohabitation	7	137			
<b>Socioeconomic Level</b>					
Worker and marginal class	16	239	1.77	0.69-4.58	0.23
Middle and high class	6	159			
<b>CD4 lymphocyte count</b>					
<500 cells/mm <sup>3</sup>	8	73	2.54	1.06-6.12	0.03
>500 cells/mm <sup>3</sup>	14	325			
<b>Total Social Support Perceived</b>					
Insufficient	13	33	15.98	7.68-33.22	0.00
Sufficient	9	365			

<sup>1</sup>ORna: Unadjusted Odds Ratio, <sup>2</sup> CI 95%: Miettinen Confidence Interval of 95%.

were included, both of which reached statistical significance in the bivariate analysis for depression. Both variables maintained an independent effect in the final model associated with the presence of depression (Table 5).

### Discussion

The HIV/AIDS and COVID-19 syndemic represents a health problem of great magnitude that goes beyond the scope of public health by converging psychological, social, ethical, economic, political, and human rights factors.<sup>22</sup>

Despite the isolation, loneliness, and economic uncertainty due to the fear of contracting the SARS-COV-2 virus,<sup>6</sup> the frequency of depression and anxiety found in this study was lower than that reported by several authors at a national and international level,<sup>23-30</sup> the differences found may be due to the design, instruments used, characteristics of the population, and sample size.

Four out of five patients perceived having sufficient total social support, in which the dimensions of confidential support, and affective resources were sufficient in more than half of the participants, coinciding with what was observed by Mosqueda-Ramírez et al,<sup>13</sup> in a cross-sectional study carried out in a CAPASITS, in Tenosique Tabasco, using the same instrument.

Regarding sociodemographic factors, it was found that the average age was in their 40's, with a predominance of men living in free union, similar to that reported by Beltrán-De la Rosa et al,<sup>23</sup> however, it differed in terms of sexual preference, and time of diagnosis, which may be related to the characteristics of the population, since it is a young adult population with an active sexual life.

More than 90% of the participants had an undetectable viral load, similar to that reported in a study carried out in Argentina,<sup>28</sup> and higher than that observed by Galindo and Ortega in the outpatient infectious disease department of a hospital in Mexico.<sup>24</sup> The CD4 lymphocyte levels >500 cells/mm<sup>3</sup> observed in this study were higher than those found in another study in Argentina.<sup>28</sup>

In the multivariate analysis, it was observed that CD4 lymphocyte count <500 cells/mm<sup>3</sup>, and insufficient perceived total social support were associated with depression. Results of this research coincide with those observed by other authors,<sup>23,30</sup> because of this, adequate CD4 lymphocyte levels, and having social support networks can possibly decrease psychosocial alterations such as, depression and anxiety, thus raising the quality of life of patients, independently of health crises such as the COVID-19 pandemic.

On the other hand, marital status and sexual preference did not reach statistical significance, contrary to what Soto and Cruz reported in Ciudad Juarez, Mexico.<sup>25</sup> Given the above, it is essential to continue conducting research studies on these, and other factors that may be associated with psychopathological conditions, and that allow us to identify areas of opportunity for the benefit of this vulnerable population.

A strength of this study consisted in identifying psychosocial alterations that allow the health professional to provide quality patient care, focused not only on treatment, but also from a biopsychosocial, empathetic, and personalized perspective.<sup>31</sup>

One of the limitations of this research was the design, since, being a cross-sectional study, temporality interferes with the association between exposure factors, and the effect. On the other hand, both the locality, and the non-probabilistic sampling predict little external validity.

### Conclusion

Nine out of ten patients perceived to have sufficient total social support, which may be related to the low prevalence of anxiety, and depression. CD4 T-lymphocyte counts below 500 cells/mm<sup>3</sup> were associated with depression. Social support strategies and adherence to antiretroviral treatment are key to the well-being of patients living with HIV/AIDS. It is important to maintain a comprehensive approach to respond to the needs of the HIV population in order to promote a healthy, fulfilling, and independent life for patients.

### Authors Contribution

JA S-R and MA S-J: conceptualization, development, writing, data collection,

**Table 5. Logistic Regression of Associated Factors With the Presence of Depression in Patients Diagnosed With HIV/AIDS.**

Presence of Depression	ORna <sup>1</sup>	ORa <sup>2</sup>	CI 95% <sup>3</sup>	MH X <sup>2</sup> for two or more classes <sup>4</sup>	Interaction Test	p Value
CD4 lymphocyte count <500 cells/mm <sup>3</sup>	2.54	2.84	1.09-5.13	4.83	1.98	0.15
Total Social Support perceived insufficient	15.98	16.36	5.31-25.61	55.18	1.95	0.16

<sup>1</sup>Unadjusted Odds ratio; <sup>2</sup>Adjusted Odds ratio; <sup>3</sup>Miettine Confidence Interval of 95%; <sup>4</sup>Mantel-Haenszel X<sup>2</sup> for two or more classes.

data analysis, discussion of results, and writing. MJ s-M: conceptualization, development, writing, data analysis, discussion of results, and writing. AJ L-M and B J-M: conceptualization, development, discussion of results, writing. All authors critically reviewed the paper, and approve its publication.

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### Conflict of Interest

The authors declare not having conflicts of interest.

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