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Association Between Financial Hardship, Resilience and Comorbid Depression and Anxiety Symptomatology in Youth From Bogota, Buenos Aires, and Lima

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ABSTRACT

Objectives: This study aims to explore the association between reported financial hardship and the presence of comorbid depression and anxiety symptomatology and to identify whether resilience modifies this relationship.

Methods: This is a case-control study with 1705 adolescents and young adults from deprived urban areas in Bogota (Colombia), Buenos Aires (Argentina), and Lima (Peru). Cases of comorbid depression and anxiety symptomatology were defined when the score of PHQ-8 and GAD-7 was higher than 9. The self-report questionnaire asked whether their family had experienced financial hardship and if it was more than a year ago, in the last year, or both periods. The association of financial hardship with comorbid depression and anxiety symptomatology was explored using logistic regressions. We assessed the possible effect modification of resilience (CD-RISC-10).

Results: Financial hardship was associated with comorbid depression and anxiety symptomatology, with the highest odds ratios for hardship reported in the last year and for hardship reported both more than a year ago and in the last year. High resilience was associated with a lower chance of comorbid depression and anxiety symptomatology, especially among participants who reported financial hardship more than a year ago.

Conclusions: This study reinforces the need for financial support programmes and community-based interventions targeting economically vulnerable youth to prevent adverse mental health outcomes.

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Asociación entre dificultades económicas, resiliencia y sintomatología comórbida de depresión y ansiedad en jóvenes de Bogotá, Buenos Aires y Lima

R E S U M E N

Palabras clave:

Depresión
Ansiedad
Dificultades económicas
Resiliencia
Juventud

Objetivos: Este estudio explora la asociación entre el reporte de dificultades económicas y la presencia de sintomatología comórbida de depresión y ansiedad, y evalúa si la resiliencia modifica esta relación.

Método: Este estudio de casos y controles incluye a 1.705 adolescentes y adultos jóvenes de zonas urbanas desfavorecidas en Bogotá (Colombia), Buenos Aires (Argentina) y Lima (Perú). Los casos de sintomatología comórbida de depresión y ansiedad se definieron con un puntaje >9 en PHQ-8 y GAD-7. El cuestionario consultaba si la familia había experimentado dificultades económicas, y si había ocurrido hace más de un año, en el último año, o en ambos periodos. Se usaron regresiones logísticas para evaluar la asociación entre dificultades económicas y sintomatología comórbida. Evaluamos la posible modificación de efecto de la resiliencia (CD-RISC-10).

Resultados: Las dificultades económicas se asociaron con presentar sintomatología comórbida de depresión y ansiedad, con *odds ratio* más altos entre quienes reportaron dificultades en el último año, y quienes las reportaron hace más de un año y en el último año. La alta resiliencia se asoció con menor chance de síntomas comórbidos, sobre todo entre quienes reportaron dificultades hace más de un año.

Conclusiones: Este estudio destaca la importancia de implementar programas de apoyo financiero e intervenciones comunitarias para jóvenes en situación de vulnerabilidad económica como estrategia de prevención en salud mental.

Introduction

Depression and anxiety are the most common mental health disorders among adolescents and young adults,¹ and they often co-occur.² Comorbid depression and anxiety symptomatology is associated with a worse prognosis for young people than either condition alone, due to greater functional impairment, less favourable response to treatment, increased suicide ideation and attempts, worse life satisfaction, and a higher risk of recurrence even through adulthood.³ Given the detrimental impact of comorbid anxiety and depression symptomatology, it is important to explore which factors may contribute to these mental health conditions.

One out of four people in Latin America and the Caribbean (LAC) live in poverty.⁴ Many impoverished people are children, adolescents and young adults from 0 to 24 years old and most reside in urban areas.⁴ According to the World Bank, LAC is one of the “most unequal regions in the world” as a result of gaps in education, healthcare, nutrition, access to technology, basic services, and work and social protection.⁴

Poverty has been associated with mental health disorders around the world.⁵⁻⁹ Research suggests a bidirectional relationship between poverty and mental health disorders.¹⁰ Poverty results in a lack of access to basic needs, such as food, healthcare, education, and adequate housing.^{11,12} Beyond deprivation, poverty is also highly stigmatized,^{13,14} and is associated with greater exposure to crime and violence.^{12,15} These challenges could lead to feelings of fear, stress, shame, uncertainty, and hopelessness.^{10,14,16} Conversely, mental health disorders can perpetuate poverty by impairing motivation, productivity, and cognitive functioning, making it harder to finish school and college and obtain and maintain stable employment.¹⁰

A concept linked to poverty and deprivation is financial hardship, which can be defined as having difficulties in meeting basic needs due to a lack of economic resources.⁶ For instance, it can mean someone cannot pay their housing bills or buy food. Previous studies have found a positive association between financial hardship and symptoms of depression and anxiety.^{5,6,9,17-26} Financial hardship is usually measured

through self-reports, capturing a subjective feeling of insufficiency in the household economy.⁶

Despite the negative associations, not all individuals exposed to financial hardship develop significant psychological distress, suggesting that protective factors, such as resilience, may play a crucial role in mitigating its impact. Resilience has been defined as withstanding or overcoming adversity and stress with minimal or no distress.^{27,28} It has been associated with better mental health outcomes in populations facing various stressors, including financial hardship.²⁹

Most studies that address the relationship between financial hardship, depression, and anxiety were conducted with adult populations^{5,9,18,19,22,24,25} and undergraduate students.^{17,21} Few studies have included adolescents in their analysis, and those that did were conducted in high-income countries.^{26,30} The studies conducted in LAC had small sample sizes with little or no control for confounding variables,^{20,23} except for two studies in Peru⁹ and Colombia³¹ that had large samples. However, the Colombian study used proxy measures of socioeconomic status (i.e., the Colombian government's official strata divisions, which exclusively considers the characteristics of the housing and its surroundings). To our knowledge this is the first study that explores financial hardship and mental health considering the comorbidity of depression and anxiety symptomatology.

This study aimed to explore the association between reported financial hardship and the presence of comorbid depression and anxiety symptomatology among adolescents and young adults living in deprived neighbourhoods in three Latin American cities. Additionally, we sought to determine whether resilience is an effect modifier in the relationship between financial hardship and comorbid depression and anxiety symptomatology.

Methods

Design

In this case-control study, cases of comorbid depression and anxiety symptomatology were defined as adolescents and young adults who had moderate to severe symptoms of depression and anxiety according to the Patient Health Questionnaire (PHQ-8 ≥ 10) and Generalized Anxiety Disorder (GAD-7 ≥ 10). Controls were participants who did not exhibit these symptom levels. The exposure variable, financial hardship, was assessed retrospectively, capturing experiences that occurred in the past. In contrast, the effect modifier, resilience, was measured cross-sectionally at the time of the survey, reflecting participants' capacity to adapt to adversity at that moment.

Setting

This case-control study is part of the OLA Research Programme (Building resilience and resources to reduce mental distress in young people in Latin America), which aims to identify which resources help young people prevent and recover from mental distress, particularly depression and anxiety.³²

This study took place in three cities in Latin America: Bogota (Colombia), Buenos Aires (Argentina), and Lima (Peru). These three capital cities are highly urbanized, rank among the most populous in Latin America, and report high levels of inequality and weak health and social protection systems.^{33,34} Specifically, we selected the 50% most deprived zones in each city, according to the United Nations Development Programme's Human Development Index³⁵ in Bogota and Lima, and according to the Unsatisfied Basic Needs Index in Buenos Aires.³⁶

Data collection took place between April 2021 and November 2022. Social restrictions due to COVID-19 were still present in some cities during this time.³⁷

Sample and recruitment

We aimed to recruit 340 cases of depression and/or anxiety and 340 controls in each of the three cities, totalling 2040 participants. The sample size calculation can be found in a previous publication.³²

Participants were recruited in educational settings (e.g., schools and universities), community settings (e.g., churches and civil society organizations), and social media platforms (e.g., Facebook and Instagram) using a convenience sample approach. Recruitment varied across cities due to COVID-19 restrictions and the resources available to each research team (see recruitment details in Ref.³⁸).

The inclusion criteria were (1) being 15–16 or 20–24 years old, (2) having the ability to give informed consent or assent, and (3) living in the city's 50% most deprived zones (see our protocol paper for more details about how we determined these zones³²). We excluded people who had a diagnosis of a severe mental illness (such as psychosis), cognitive impairment, and illiteracy. These criteria were assessed during the screening process.

Procedures

The research team screened people interested in participating in the study and completed the process of acquiring their informed consent or assent. Then, they completed a questionnaire, which took 30–60 min to complete, under the supervision of a research team member. The questionnaire was completed on paper or online form through the REDCap platform.^{39,40} A trained researcher manually entered the paper questionnaires on REDCap.

Variables and instruments

Cases and controls

To identify cases of comorbid depression and anxiety symptomatology and controls, we utilized the Patient Health Questionnaire (PHQ-8⁴¹) and the Generalized Anxiety Disorder (GAD-7⁴²).

The PHQ-8 is an 8-item questionnaire that assesses the frequency of depressive symptoms experienced over the past 14 days. Each item is rated on a scale of 0 (no day) to 3 (almost every day) and corresponds to a depressive symptom as defined by the DSM-IV diagnostic guidelines.⁴³ The total score of the questionnaire is the sum of all item scores. A score above 9 indicates moderate to severe depressive symptoms.⁴¹

The GAD-7 is a 7-item self-report questionnaire that assesses the frequency of anxiety symptoms over the last 14 days. Each item is rated on a scale of 0 (no day) to 3 (almost every day) and corresponds to the anxiety symptoms defined by the DSM-IV diagnostic guidelines.⁴³ The total score of the questionnaire is the sum of all item scores. Similarly to the PHQ-8, a score above 9 refers to moderate to severe anxiety symptoms.⁴²

Previous Latin American studies have shown the validity and reliability of the PHQ-8^{44,45} and GAD-7^{46–49} in the region. With our sample, the PHQ-8 and GAD-7 show adequate internal structure, internal consistency, divergent validity, and measurement invariance for gender, age, education and cities.⁵⁰

In this study, the cases of comorbid depression and anxiety symptomatology had PHQ-8 and GAD-7 scores higher or equal to 10, whereas controls had scores lower than 10 on both scales.

Exposure

To assess financial hardship, we used an item from the adapted version⁵¹ of the Adolescent Appropriate Life Events Scale.⁵² The scale is in Spanish and includes 30 stressful life events, allowing participants to indicate whether they had experienced each event ever, more than a year ago, in the past year, or at both time points. The item that assessed financial hardship was “Your family had ongoing money problems, e.g., not able to pay rent or bills”.

Effect modifier

To assess resilience levels, we used the Spanish version⁵³ of the Connor-Davidson Brief Resilience Scale (CD-RISC-10^{54,55}). This is a 10-item scale designed to assess an individual’s ability to cope with stress and adversity. Each item is rated using a 4-point Likert scale (1 = never, 4 = most of the time). The total score is calculated by summing the scores of all items. We divided the scores at the median, with values of 0–24 indicating low resilience and 25–40 high resilience. Previous articles have found evidence of the scale’s validity and reliability in Latin American samples.^{56–58}

Confounding variables

Gender (male, female, other), age group (adolescent [15–16-year-old], young adult [20–24-year-old]), and city (Bogotá, Buenos Aires, Lima) were all included as potential demographic confounding variables.

To control for other possible socioeconomic factors, we assessed the highest formal education degree achieved by either parent (none, primary, secondary, higher education), excluding “other” answers and household crowding (no crowding ≤ 2 people per bedroom, crowding > 2 people per bedroom, according to the Economic Commission for LAC⁵⁹).

Finally, we used the Human Development Index (HDI) for each district or neighbourhood from Bogotá and Lima and standardized the zone’s indexes for each city. We did the same process for the data from Buenos Aires, but we used the Unsatisfied Basic Needs Index (UBN) since the HDI was unavailable at the time of baseline recruitment.

These confounding variables were selected due to evidence showing they are associated with financial hardship, depression and anxiety.^{4,60–64}

Data analysis

Firstly, we deleted observations with missing values. Then, we obtained the absolute and relative frequencies for categorical variables and the mean and standard deviation for continuous variables. We divided this descriptive report by cases and controls of comorbid depression and anxiety symptomatology.

We used logistic regression to estimate the odds ratios (OR) for comorbid depression and anxiety symptomatology, with a 95% confidence interval. First, we conducted a crude logistic regression with financial hardship as the independent variable, followed by an adjusted model that accounted for confounding variables. We checked the non-multicollinearity assumption for the adjusted logistic regression model using the Variance Inflation Factor (VIF). We considered a VIF higher than five to indicate problematic multicollinearity.⁶⁵ For subgroup analyses, we stratified the adjusted model by gender (male, female) and age group (adolescent, young adult).

To explore the effect modification of resilience, we added an interaction between financial hardship and resilience levels in the adjusted logistic regression model. The significance of this interaction was assessed using the *testparm* command in STATA.⁶⁶ A predicted probabilities report allowed the visualization of the interaction between financial hardship and resilience levels and its association with comorbid depression and anxiety symptomatology. These predicted probabilities were calculated from the adjusted model, including the interaction with resilience.

Ethics

Informed consent was provided by young adults and adolescents’ legal guardians. Adolescents also provided their informed assent. The study protocol was approved by the Institutional Review Boards of Universidad de Buenos Aires (October 2nd, 2020), Pontificia Universidad Javeriana (ref. FM-CIE-1138-20), Universidad Peruana Cayetano Heredia (Certificate 581-33-20) and the Research Ethics Committee of Queen Mary, University of London (ref. QMERC2020/02).

Results

We collected 2405 questionnaire responses out of 6176 potentially eligible individuals. However, two participants withdrew from the study, and one had completed the questionnaires twice. After excluding these cases, we retained data from 2402 participants. To focus on individuals with comorbid depression and anxiety symptomatology and those without significant symptoms of either condition, we excluded participants who reported only symptoms of either depression or anxiety (i.e., PHQ-8 and GAD-7 scores lower than 10). Additionally, we removed entries with missing values. Individuals with and without missing values had similar distributions in the exposure and outcome variables ([Supplementary Material 1](#)).

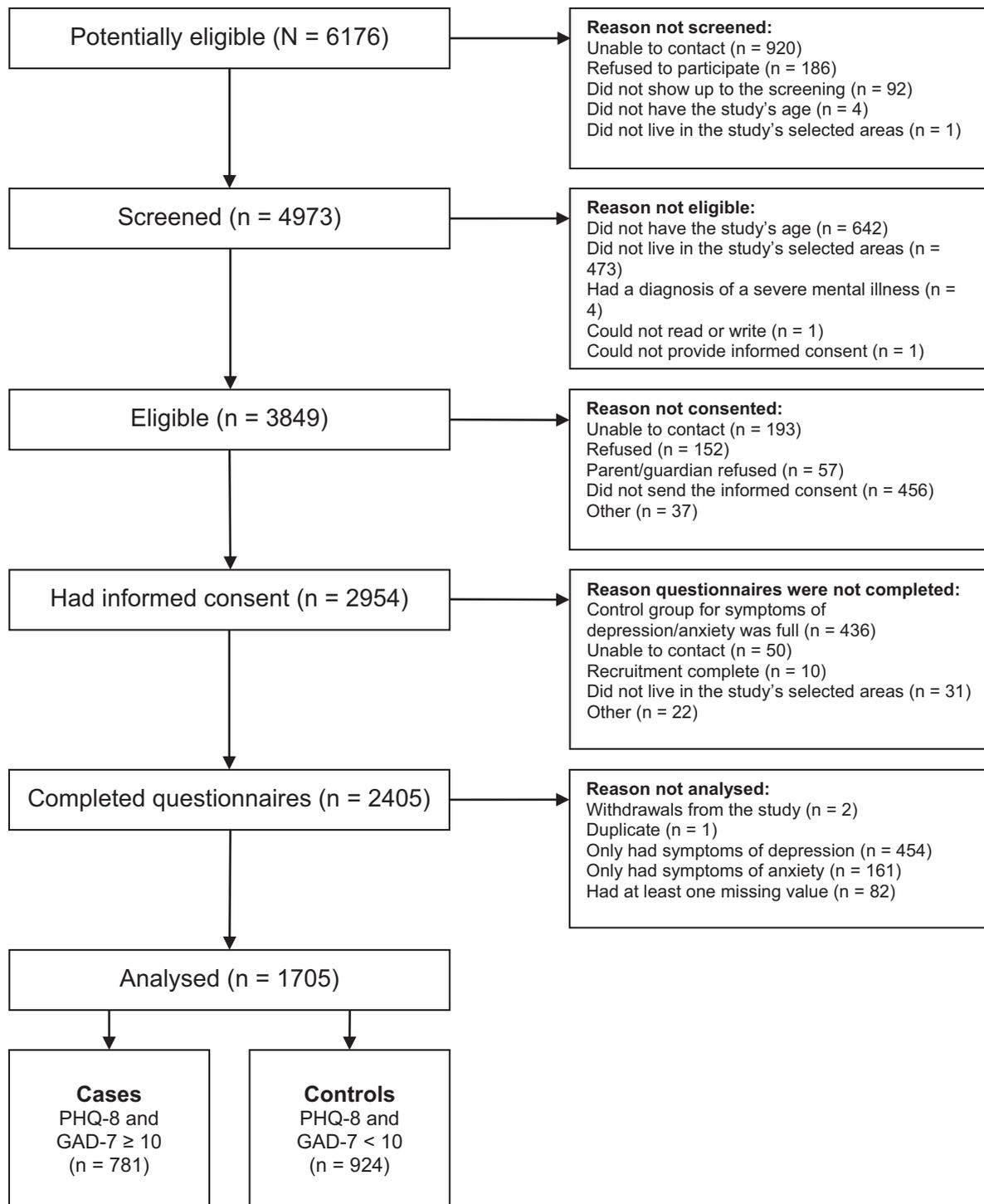


Fig. 1 – Flowchart of the number of participants at each stage of recruitment.

We were left with 1705 participants, of whom 781 were cases and 924 were controls. Fig. 1 shows the detailed participant flow from recruitment to analysis.

Table 1 shows participants' sociodemographic characteristics by case-control status. Our sample had a similar number of people across age groups but mainly comprised females. Also, most parents had completed secondary education. 42% of the sample reported never experiencing financial hardship,

whereas 30% reported hardship more than a year ago, 21% in the last year, and 7% at both time points.

We identified an association between financial hardship and comorbid depression and anxiety symptomatology, and this association remained significant even after controlling for potential confounding variables (Table 2). The adjusted estimates show that, compared to participants who never experienced financial hardship, the cases of comorbid depres-

Table 1 – Participants' sociodemographic characteristics by comorbid depression and anxiety symptomatology status.^a

Variable	Cases (n = 781)	Controls (n = 924)
<i>Gender, n (%)</i>		
Male	174 (22.28%)	408 (44.16%)
Female	590 (75.54%)	512 (55.41%)
Other	17 (2.18%)	4 (0.43%)
<i>Age group, n (%)</i>		
Adolescent (15–16 years old)	359 (45.97%)	411 (44.48%)
Young adult (20–24 years old)	422 (54.03%)	513 (55.52%)
<i>City, n (%)</i>		
Bogotá	359 (45.97%)	337 (36.47%)
Buenos Aires	155 (19.85%)	250 (27.06%)
Lima	267 (34.19%)	337 (36.47%)
<i>Parent's highest formal education, n (%)</i>		
None	60 (7.68%)	57 (6.17%)
Primary	140 (17.93%)	226 (24.46%)
Secondary	317 (40.59%)	419 (45.35%)
Higher	264 (33.80%)	222 (24.03%)
<i>Household crowding, n (%)</i>		
≤2 people per bedroom	617 (79.00%)	720 (77.92%)
>2 people per bedroom	164 (21.00%)	204 (22.08%)
<i>Financial hardship, n (%)</i>		
Never	251 (32.14%)	467 (50.54%)
More than a year ago	240 (30.73%)	274 (29.65%)
In the last year	217 (27.78%)	145 (15.69%)
More than a year ago and in the last year	73 (9.35%)	38 (4.11%)
<i>Standardized HDI/UBN index^b, mean (±SD)</i>	−0.72 (±0.44)	−0.71 (±0.42)
<i>Resilience levels^c, n (%)</i>		
Low	513 (65.69%)	353 (38.20%)
High	268 (34.31%)	571 (61.80%)

^a Cases of comorbid depression and anxiety symptoms were defined as having scores greater than 9 on both the PHQ-8 and GAD-7 scales.

^b We standardized the district's Human Development Index (HDI) for Bogotá and Lima and the Unsatisfied Basic Needs Index (UBN) for Buenos Aires.

^c Resilience was measured using the CD-RISC-10 scale and dichotomized at the median score.

Table 2 – Association between financial hardship, resilience, and comorbid depression and anxiety symptomatology.^a

Exposure	Crude estimates		Adjusted estimates	
	OR	95% CI	OR	95% CI
<i>Financial hardship</i>				
Never (Reference)				
More than a year ago	1.63	1.29, 2.05	1.55	1.20, 2.00
In the last year	2.78	2.15, 3.61	2.66	2.01, 3.53
More than a year ago and in the last year	3.57	2.35, 5.45	3.20	2.03, 5.04
<i>Resilience^b</i>				
Low (Reference)				
High	0.32	0.26, 0.39	0.35	0.28, 0.43

Note. The model was adjusted for gender, age group, city, parent's highest formal education, household crowding, and standardized HDI and UBN scores (VIF = 1.90). Resilience was also included as a confounder in this model, and its adjusted estimates are presented in the table. OR = Odds ratio; 95% CI = 95% confidence interval.

^a Comorbid depression and anxiety symptoms were defined as having scores greater than 9 on both the PHQ-8 and GAD-7 scales.

^b Resilience was measured using the CD-RISC-10 scale and dichotomized at the median score.

sion and anxiety symptomatology had 1.55 times higher odds of reporting financial hardship more than a year ago, 2.66 times higher odds of reporting hardship in the last year, and 3.20 times higher odds of reporting hardship in the last year and more than a year ago.

We stratified the results by gender and age group to explore association tendencies. We identified a consistent pattern of stronger associations between financial hardship and comorbid depression and anxiety symptomatology among young adults compared to adolescents ([Supplementary table* 2](#)). This

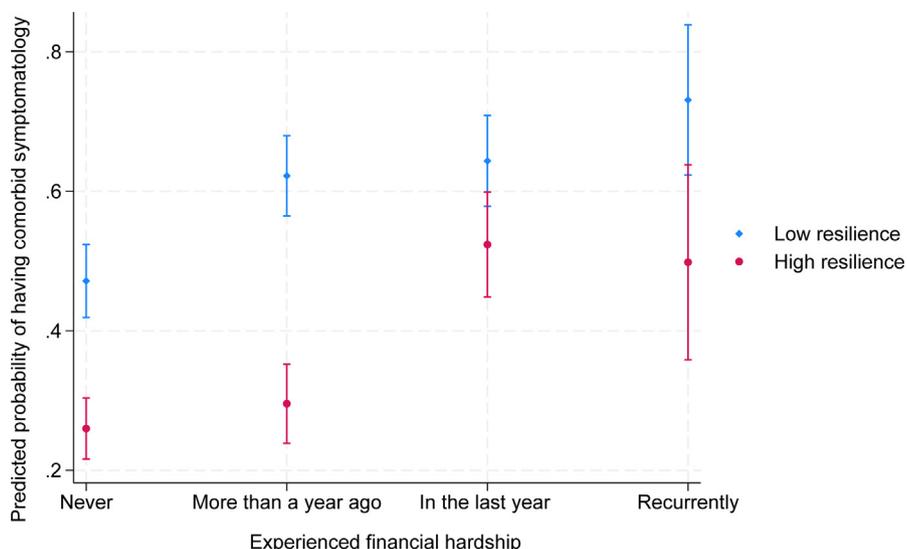


Fig. 2 – Predicted probabilities of comorbid depression and anxiety symptomatology^a by financial hardship and resilience levels^b. Note. The predicted margins were obtained from the adjusted logistic regression model (adjusted by gender, age group, city, parent’s highest formal education, household crowding, and standardized HDI and UBN scores) with an interaction between financial hardship and resilience levels. Recurrently means that the participant experienced financial hardship both in the last year and more than a year ago. ^a Comorbid depression and anxiety symptoms were defined as having scores greater than 9 on both the PHQ-8 and GAD-7 scales. ^b Resilience was measured using the CD-RISC-10 scale and dichotomized at the median score.

pattern was not observed in the analysis stratified by gender due to the wide confidence intervals and lack of precision in the estimates for males (Supplementary table* 3).

Additionally, individuals who had comorbid depression and anxiety symptomatology were less likely to have high resilience (Table 2). Moreover, the interaction analysis assessing whether resilience levels modified the relationship between financial hardship and symptoms of depression and anxiety yielded $\chi^2(3)=9.78, p < .021$. This suggests that the association between financial hardship and case-control status varies by resilience levels.

The model’s predicted probabilities shown in Fig. 2 indicate that participants who had high resilience and never reported experiencing financial hardship or reported it more than a year ago had a significantly lower predicted probability of having comorbid depression and anxiety symptomatology compared to individuals with low resilience. High resilience also reduced the predicted probabilities of being a case in participants who reported experiencing financial hardship in the last year and both in the last year and more than a year ago; however, the confidence intervals overlapped with low resilience individuals.

Discussion

This study aimed to explore the association between financial hardship and the presence of comorbid depression and anxiety symptomatology and to identify whether resilience works as an effect modifier in this relationship among adolescents and young adults living in deprived neighbourhoods in three Latin American Cities. We found that young people with comorbid depression and anxiety symptomatology had higher

odds of having experienced financial hardship. The odds were higher if the event was recent (i.e., in the last year) or if it happened at different time points (i.e., more than a year ago and in the last year) in comparison to having experienced it only at a distant time point (i.e., more than a year ago).

Resilience was shown to modify the relationship between financial hardship and symptoms of anxiety and depression. If participants had high resilience, they had a lower chance of showing comorbid depression and anxiety symptomatology, independent of the condition in financial hardship, but especially among participants who reported financial hardship more than a year ago.

Our findings match empirical evidence from high-income countries linking financial hardship and mental health problems in a young population.^{21,26,30} Adolescents perceive the family’s economic difficulties, but they do not have much agency in the subject due to their age, which would explain feelings of powerlessness leading to stress and worry.^{30,67} Moreover, adolescents could experience feelings of inferiority because financial hardship means that they cannot afford certain items or activities that their peers do.^{68,69} Regarding young adults, they are pursuing higher education or transitioning into the workforce⁷⁰; therefore, financial difficulties can lead to expectations for them to contribute to their household’s finances despite their limited work experience or education, increasing experiences of stress.⁷¹

Previous studies have also identified that current financial hardship has a stronger relationship with mental health problems than previous financial hardship.^{6,19} Guan et al.⁶ suggest that the effect of financial hardship decays over time as it no longer becomes a current worry.

The protective role of resilience against comorbid depression and anxiety symptomatology was present in this study. Resilient individuals may use active coping strategies, maintain a sense of control, and remain optimistic when facing adversity, which would protect them against mental health problems.^{27,72} However, Hickman⁷³ argues that for people living in deprived economic situations, resilience is about “enduring”, “surviving”, and “getting by”, which is exhausting. This also concurs with De France et al.,⁷⁴ who sustain that people exposed to poverty who exhibit high resilience also show detrimental physical health consequences, although they have better psychological well-being scores.

Policy implications

The eradication of poverty is a difficult and complex aim in Latin America. It requires structural changes and strong financial and political commitment. The Economic Commission for Latin America and the Caribbean⁷⁵ suggests that governments should implement efficient education, health, labour inclusion, and care policies to protect household income and build human capacities.

Young people can also benefit from programmes that provide financial literacy, employment support, and direct financial aid, which may help reduce the psychological burden associated with economic uncertainty. Mancone et al.⁷⁶ reviewed interventions for financial literacy that targeted children and adolescents and maintained that early financial education establishes a strong basis for their financial well-being in adulthood.

Efforts should also be made to strengthen protective factors among adolescents and young adults in deprived communities to enhance the management of stress and reduce the detrimental impact on their mental health. There are evidence-based interventions to improve resilience resources that could be implemented in schools, universities, communities, and community-based organizations.^{77–80} Additionally, governments should prioritize funding accessible community and primary mental health services to address the health, social, and economic consequences of mental illness.⁸¹ Such investments would help ensure that individuals facing hardship have access to the emotional and behavioural support they need, preventing further deterioration of their mental health.

Strengths and limitations

One strength of this study is the scope, as it analyses a large, underrepresented sample, which has over two thousand adolescents and young adults living in deprived areas of Latin America. To our knowledge, no previous studies in the area have examined the relationship between financial hardship, resilience, and mental health problems in adolescents and young adults.

However, the study has some limitations. First, we risk selection bias due to the nature of our sampling, which was a convenience sample. To address this limitation, we adjusted our analysis for sociodemographic variables, but we acknowledge that the convenience sample limits the generalisability of our results. Also, the questionnaire’s self-report nature can

jeopardize the data’s accuracy due to recall bias and social desirability. Finally, causal inferences cannot be made due to the non-experimental nature of the study design.

Conclusions

In conclusion, this study found a significant association between financial hardship and comorbid depression and anxiety symptomatology among adolescents and young adults living in deprived neighbourhoods in Bogotá, Buenos Aires, and Lima. Financial hardship reported in the last year and both in the last year and more than a year ago had a stronger association with comorbid depression and anxiety symptomatology than financial hardship reported more than a year ago. Additionally, resilience is shown to be protective against comorbid depression and anxiety symptomatology.

These findings contribute to the understanding of the social determinants of youth mental health in an underrepresented Latin American sample. They highlight the importance of addressing financial stressors and strengthening resilience as part of mental health prevention and intervention efforts. Policies should promote social protection, employment opportunities, financial literacy, community-based resilience programmes, and access to mental health services to improve the wellbeing of young people living in deprived communities.

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Conflicts of interest

The authors have no conflicts of interest to declare.

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