ORIGINAL ARTICLE

DSM-IV personality disorders in Mexico: results from a general population survey

Trastornos de personalidad DSM-IV en México: resultados de una encuesta de población general

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Abstract

Objective: *This paper reports the first population estimates of prevalence and correlates of personality disorders in the Mexican population.* ***Method:*** *Personality disorders screening questions from the International Personality Disorder Examination were administered to a representative sample of the Mexican urban adult population (n = 2,362) as part of the Mexican National Comorbidity Survey, validated with clinical evaluations conducted in the United States. A multiple imputation method was then implemented to estimate prevalence and correlates of personality disorder in the Mexican sample.* ***Results:*** *Multiple imputation method prevalence estimates were 4.6% Cluster A, 1.6% Cluster B, 2.4% Cluster C, and 6.1% any personality disorder. All personality disorders clusters were significantly comorbid with DSM-IV Axis I disorders. One in every five persons with an Axis I disorder in Mexico is likely to have a comorbid personality disorder, and almost half of those with a personality disorder are likely to have an Axis I disorder.* ***Conclusions:*** Modest associations of personality disorders with impairment and strong associations with treatment utilization were largely accounted for by Axis I comorbidity suggesting that the public health significance of personality disorders lies in their comorbidity with, and perhaps effects upon, Axis I disorders rather than their direct effects on functioning and help seeking.

Descriptors: *Epidemiology; Personality disorders; Prevalence; Mental health; Mexico*

Resumen

Objetivo: *Este trabajo presenta las primeras estimaciones poblacionales de la prevalencia de los trastornos de personalidad y sus correlatos en la población mexicana.* ***Método:*** *Se aplicó un tamizaje con base en el* International Personality Disorder Examination *a una muestra representativa de la población adulta mexicana en áreas urbanas (n = 2362) como parte de la Encuesta Mexicana Nacional de Epidemiología Psiquiátrica, validada con evaluaciones clínicas realizadas en los Estados Unidos.* ***Resultados:*** *Se implementó un método de imputación múltiple para estimar la prevalencia y los correlatos de los trastornos de personalidad en la muestra mexicana proporcionando una prevalencia de 4.6% Grupo A, 1.6% Grupo B, 2.4% Grupo C, y 6.1% cualquier trastorno de personalidad. Todos los grupos de trastornos de personalidad fueron significativamente comórbidos con los trastornos del Eje I del DSM-IV. Una de cada cinco personas con un trastorno de Eje-I en México presenta un trastorno de personalidad comórbido y casi la mitad de aquellos con un trastorno de personalidad presenta un trastorno del Eje I.* ***Conclusiones:*** *Asociaciones modestas de trastornos de personalidad con discapacidad y asociaciones mayores con la utilización de servicios se debe a la comorbidad con el Eje-I. El impacto de los trastornos de personalidad en la salud pública reside en su comorbilidad con los trastornos del Eje-I y no en su impacto directo sobre el funcionamiento o la búsqueda de ayuda.*

Descritores: *Epidemiología; Trastornos de la personalidad; Prevalencia; Salud mental, México*

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Introduction

General personality functioning in some individuals becomes sufficiently dysfunctional as to be considered a personality disorder (PD). These disorders are further classified in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) into Cluster A (odd or eccentric type), Cluster B (dramatic, emotional or erratic type), Cluster C (anxious and fearful type) or Not Otherwise Specified.[1] Research in the past decade has provided reliable epidemiological data on PDs in the general population. Coid et al. presented a comparison of PD community study findings with regards to their varying use of diagnostic systems, diagnostic instruments (mostly the International Personality Disorder Examination - IPDE, the Personality Disorder Examination - PDE, the Structured Clinical Interview for DSM-IV Axis II Personality Disorders - SCID-II, and the Structured Interview for the DSM Personality Disorders - SIDP), sampling methods and size.[2] The available evidence, primarily from economically developed countries such as the United States,[3-6] Germany,[7] Norway,[8] Great Britian[2] and Australia,[9] suggests that PDs are present in 4% (in Great Britain) to 15% (in one study of the U.S. population) of the general population.[2-9] Being male, younger, single, unemployed and with less education is associated with PDs in several, but not all of these previously mentioned studies. There is also evidence that PDs are highly comorbid with Axis I disorders, burdensome with regards to impairment in role functioning, and burdensome with regards to utilization of both general medical and mental health specialty services.[6,10-18] However, all these studies have been conducted in economically advantaged regions of the world; PDs have been relatively neglected as a research interest in Latin America and the rest of the developing world.

The purpose of this report is to provide epidemiological estimates of PDs in a middle-low income Latin American country, in this case Mexico, in a first attempt to determine whether the distribution of PDs in the developing world is similar to that of regions for which there is more information. To our knowledge, no representative community survey has been conducted in Mexico addressing the epidemiology of PDs in the Mexican population. Only one small, non-representative pilot study in a specific region of Mexico City has reported PD estimates, which varied greatly depending upon the measurement instrument; 7.2% had any PD using the Temperament and Character Inventory (TCI) and 28.6% using the Personality Diagnosis Questionnaire-revised (PDQ-R).[19]

We report data from the Mexican National Comorbidity Survey (M-NCS) that has been conducted as part of the World Health Organization's (WHO) World Mental Health (WMH) Surveys Initiative (http://www.hcp.med.harvard.edu/wmh/) to estimate the prevalence of psychiatric disorders in Mexico. The epidemiology of DSM-IV Axis I disorders from the M-NCS has been reported previously.[20,21] The objective, therefore, of this report is to provide nationally representative estimates from this survey on the prevalence of PDs, the sociodemographic correlates of these disorders, the comorbidity between PD clusters and between PDs and Axis I disorders, the role impairment associated with PDs, and the service utilization patterns among persons with PDs.

Method

1. Sample

A general description of the M-NCS (called the *Encuesta Nacional de Epidemiología Psiquiátrica in Spanish*) has been described earlier.[20,21] Briefly, the M-NCS was based on a stratified, multistage probability sample of non-institutionalized persons aged 18 to 65 years old living in urban areas of Mexico. Areas with more than 2,500 inhabitants are considered urban, and about 75% of the Mexican population lives in such areas.

The sample was selected as follows. The primary selection units (PSUs) were the census count areas cartographically defined and updated by the National Institute of Statistics, Geography, and Informatics (*Instituto Nacional de Estadística, Geografía e Informática*). A total of 200 PSUs were selected, with probability proportional to population size in each of the regions. The secondary sampling units were city blocks, with five city blocks selected within each PSU, with probability proportional to the size of each secondary sampling unit within each selected PSU. All the households within the selected city blocks were listed, and compact segments of approximately 10 households were formed, from which one segment was selected with equal probability, and all the households within that segment were included. Finally, one respondent was randomly selected from among the eligible household members in each household. Eligible household members were defined as all the Spanish-speaking persons who normally ate, slept, prepared meals, and were housed in the household and who were 18 to 65 years old.

The first phase of fieldwork took place from September through December 2001 during which households were visited with up to five callbacks in order to obtain an interview. From January through May 2002 a second phase was implemented in order to reduce the non-response rate from households in the sample and to obtain more completed individual interviews. The strategy was to complete up to 10 callbacks (including those already completed in the first round) for each non-responding household and each non-responding individual. No financial incentives were given to the participants during any phase of the survey. The Human Subjects Committee of the National Institute of Psychiatry approved the recruitment, consent and field procedures. A total of 5,826 interviews were completed. The response rate was 76.6%.

2. Interviewers, interviewer training, and quality control

The fieldwork was conducted by 34 lay interviewers who went through five days of training and several booster training sessions throughout fieldwork. A number of quality assurance measures were taken, such as preparing field manuals and providing continuous *in situ* feedback to supervisors and interviewers. Finally, quality control programs from the SAS statistical software package were used to identify possible errors regarding the dating of events (onset and recency, age consistency, and first and last service utilization), as well as to detect missing information. Households with incorrect or missing information were revisited.

3. Diagnostic assessment

The instrument used was the WMH Survey version of the Composite International Diagnostic Interview (CIDI), a structured diagnostic interview, installed on a laptop computer and administered face to face.[22] The CIDI provides diagnoses based on the criteria of the DSM-IV. The translation of the instrument into Spanish was carried out by an international panel of mental health experts that was convened by the World Health Organization (WHO). The panel followed WHO recommendations, with back-translation of selected items and terms of the clinical sections. The panel worked on the disagreements between the back-translation and the original English version resolving these disagreements by consensus. Additional minor adaptations to the Mexican context were made by consensus among the Mexican researchers who were responsible for the M-NCS.

All 5,826 of the M-NCS respondents were administered a short form (Part I) of the CIDI, and a selected subsample of 2,362 were administered a long form (Part II) of the CIDI, which had a number of supplemental questions on risk factors and additional disorders, including a series of screening questions for PDs. The subsample receiving the long form consisted of all the respondents who screened positive for any disorder on Part I (619 unweighted persons), plus a probability subsample of other Part I respondents (1,743 unweighted persons). The data reported in this article are based on this subsample of 2,362 persons that completed the screener questionnaire for PDs.

1) The PDs screening questions

In participating sites of the WMH Surveys, including Mexico, PD screening questions for each of the PD clusters from the IPDE were included in the long form Part II of the M-NCS, based on an analysis of a dataset from an earlier study.[23,24] The IPDE screen comprises true/false self-report items intended to assess PDs. One study reports a sensitivity of 1.00 and a specificity of 0.61 with regards to the full clinician-administered IPDE.[24] In the United States only, clinical reappraisal interviews with the full IPDE were carried out with a probability subsample of 214 Part II respondents that over-sampled those who screened positive for one or more of the IPDE screening questions in the National Comorbidity Survey Replication (NCS-R) in the US.[6] The result of this validity study was then used to link screening question responses with the IPDE clinical diagnoses. The multiple imputation (MI) method is a statistical method to impute estimations (in this case of full clinician administered IPDE diagnoses) based on incomplete data (in this case IPDE screen items), which would approximate estimations should all participants have complete data (a full clinician administered IPDE). MI was implemented to estimate prevalence and to adjust significance tests for the fact that the predicted clinical diagnoses are imperfectly related to actual clinical diagnoses in the US NCS-R part II sample.[25] Predicted probabilities for IPDE diagnoses (Any Cluster A, Any Cluster B, Any Cluster C, Any PD including PD NOS) were assigned to each Part II NCS-R respondent who did not participate in the clinical reappraisal survey based on the results of stepwise logistic regression in the clinical reappraisal sample of clinical diagnoses on screening questions. Details of these imputation procedures are available elsewhere.[6] We used in Mexico the results of this imputation procedure to generate our own corrected prevalence of PD diagnoses, based on the assumption that the calibration of the IPDE diagnoses in the US clinical reappraisal study applies as well to the other WMH countries; an assumption that cannot be tested here in light of the fact that clinical reappraisal studies for adult IPDE were not carried out in any of the other countries.

2) Comorbid DSM-IV disorders

The Axis I DSM-IV disorders evaluated in the core WHM-CIDI assessment include anxiety disorders (panic disorder with or without agoraphobia, generalized anxiety disorder, specific phobia, social phobia, agoraphobia without panic disorder, posttraumatic stress disorder, separation anxiety disorder), mood disorders (major depressive disorder, bipolar disorder I or II or hypomania, dysthymic disorder), impulse-control disorders (oppositional-defiant disorder, conduct disorder, attention-deficit/hyperactivity disorder, intermittent explosive disorder), and substance use disorders (alcohol and illicit drug abuse with or without dependence, nicotine dependence). Organic exclusion rules and diagnostic hierarchy rules were used in making diagnoses. We focused on the 12-month comorbid prevalence of these disorders with PDs in this current report. Haro et al. found generally good concordance between DSM-IV/CIDI diagnoses of anxiety, mood, and substance disorders and parallel diagnoses based on the SCID in a report of reappraisal studies in several WMH countries, including one Spanish speaking country, Spain.[26] Impulse-control disorder diagnoses were not validated.

3) Other correlates of PDs

We also examined sociodemographic factors, role impairment, and 12-month treatment. Sociodemographic factors included gender, age at interview, completed number of years of education, employment status [employed or other (student, homemaker, unemployed), standardized income, and marital status (married/cohabitating or not married). The World Health Organization Disability Assessment Schedule (WHO-DAS) was administered to evaluate role impairment in basic activity (self-care, mobility, and cognition) and instrumental activity (quality of productive role performance, quality of social role performance), as well as global functioning, which is the mean of the five domains of functioning over a 30-day recall period.[27] Each of these was assessed using a continuous scale with a theoretical range of 0-100. Treatment was assessed by asking respondents about past year treatment for any emotional or substance use problems by a psychiatrist, any other mental health professional (e.g., clinical psychologist, psychiatric social worker), a general medical health care provider, a human services professional (e.g., religious counselor, a social worker seen in at a social services agency), or in the complementary-alternative medicine (CAM) sector (either participation in a self-help group or treatment by a CAM professional).

4. Analysis method

The data analyzed in this report were obtained from a stratified multistage sample and were subsequently weighted to adjust for differential probabilities of selection and non-response. Post-stratification to the total Mexican population according to the year 2000 Census in the target age and sex range was also performed. The analyses performed for the Mexican survey followed closely the work of Lenzenweger et al.[6] PD prevalence estimates were calculated as the means of MI prevalence estimates. The proportion of respondents with the various PDs who received treatment in the past 12 months was also estimated as a mean of MI estimates. Associations of PDs with sociodemographic factors, with Axis I DSM-IV disorders and with treatment were estimated using logistic regression analysis, again with parameter estimates averaged over the MI replications. Logistic regression coefficients and their standard errors were exponentiated and are reported as odds ratios (ORs) and their 95% confidence intervals (CIs). Associations of PDs with impairment were estimated using linear regression equations adjusted for age and sex in one model and for age, sex and any Axis I disorder in a second model. Because the sample design features weighting and clustering, all parameter estimates were estimated using the design-based Taylor series linearization method implemented in the SUDAAN software system.[28,29] Significance tests of sets of coefficients in the logistic regression equations were made using Wald χ^2 tests based on design-corrected MI coefficient variance-covariance matrices. Statistical significance was evaluated using two-sided design-based tests and the 0.05 level of significance.

Results

1. The prevalence of PDs and comorbidity between PD clusters

The MI prevalence estimate of any PD was 6.1% (SE = 0.7) (data not shown on Tables). The most frequent type of PD was Cluster A 4.6% (SE = 0.7), followed by cluster C, 2.4%

Table 1 – Sociodemographic predictors of personality disorders

Sociodemographic predictor	Cluster A			Cluster B			Cluster C			Any		
	OR	95%CI	p-value	OR	95%CI	p-value	OR	95%CI	p-value	OR	95%CI	p-value
Sex - female (vs. male)	0.1	(0.1; 0.3)	0.01	0.3	(0.1; 1.3)	0.09	0.4	(0.2; 1.1)	0.07	0.3	(0.1; 0.6)	0.01
Age - standardized	0.7	(0.5; 1.2)	0.17	0.4	(0.2; 0.8)	0.01	1.1	(0.7; 1.9)	0.69	0.8	(0.5; 1.2)	0.20
Education – standardized	0.7	(0.5; 1.1)	0.09	0.6	(0.3; 1.2)	0.13	0.8	(0.5; 1.3)	0.26	0.8	(0.6; 1.0)	0.05
Employment – other (vs. employed)	1.2	(0.4; 3.1)	0.74	1.4	(0.4; 5.5)	0.58	1.2	(0.5; 3.2)	0.68	1.2	(0.7; 2.2)	0.47
Income – standardized	1.1	(0.7; 1.7)	0.70	0.9	(0.4; 2.5)	0.87	0.9	(0.5; 1.5)	0.60	1.0	(0.7; 1.5)	1.00
Marital status – not married (vs. married)	1.0	(0.4; 2.5)	0.97	0.8	(0.2; 2.6)	0.69	1.2	(0.5; 3.1)	0.70	1.0	(0.5; 2.3)	0.90

Sociodemographic predictors fit simultaneously in a single model

(SE = 0.5) and finally Cluster B 1.6% (SE = 0.4). There were elevated odds of comorbidity between the three clusters of PDs indicating that the co-occurrence of PDs is common. The greatest comorbidity was found between Cluster A and Cluster B disorders (OR = 24.9, 95% CI = 5.5-113.8), followed by Cluster B and C disorders (OR = 14.9; 95% CI = 4.0-56.0) and finally Cluster A and C disorders (OR = 12.9; 95% CI = 4.5-37.0).

2. Sociodemographic correlates of PDs

Table 1 presents the sociodemographic correlates of Cluster A, B, C and any PD. Being female was associated with lesser odds of any PD (OR = 0.3; 95% CI = 0.1-0.6; $p < 0.001$) mostly due to much lesser odds of having a Cluster A disorder (OR = 0.1; 95% CI = 0.1-0.3; $p < 0.001$). Those with higher levels of education had marginally lower odds of any PD (OR = 0.8; 95% CI = 0.6-1.0; $p = 0.05$). None of the other correlates (age, employment, income or marital status) was significantly associated with presenting any PD. Older participants had lesser odds of a Cluster B disorder (OR = 0.4; 95% CI = 0.2-0.8; $p < 0.01$).

3. Comorbidity with DSM-IV Axis I disorders

The comorbidity of PDs and Axis I disorders is shown on Table 2. These associations (ORs) are consistently positive and large in size. Those with any Axis I disorder had almost seven times the odds of any PD (95% CI = 3.7-12.5). Individuals with a greater number of Axis I disorders had greater odds of any PD, ranging from four times the odds (95% CI = 1.9-9.3) for those meeting criteria for only one Axis I disorder to 19 times the odds (95% CI = 7.7-48.2) for those meeting criteria for three or more Axis I disorders. Almost all types of Axis I disorders were associated with all types of PDs, although some had a greater strength of association for different cluster types. Those with anxiety, mood or impulse control disorders had the greatest odds for Cluster C disorders (OR = 17.9, 95% CI = 8.5-37.7; OR = 13.9, 95% CI = 6.9-28.0; OR = 8.4, 95% CI = 1.9-37.1, respectively). On the other hand, those with substance use disorders had the greatest odds for Cluster B (OR = 23.7, 95% CI = 7.0-79.8). The only lack of statistical significance for comorbidity was found for impulse control disorders with Cluster A disorders.

Table 3 shows the conditional prevalence of disorders, the row percentages representing the proportion of respondents with each group of Axis I disorder who meet criteria for PDs and the column percentages representing the proportion of respondents with PDs that meet criteria for the Axis I disorders. For example, examining the composite final row "Any disorder" with the composite final column "Any PD", overall 20.3% of those with any Axis I disorder had any PD; also, 44.7% of those with any PD had any Axis I disorder. Those with cluster B disorders had the highest prevalence of any Axis I disorder, 71.4%. The conditional prevalence of a PD was fairly similar for respondents with any anxiety disorder (21.7%), any mood disorder (23.7%), any impulse-control disorder (25.2%), and any substance use disorder (29.4%) and increased with the number of Axis I disorders, such that the conditional prevalence of a PD for those with one Axis I disorder was 14.3% while the conditional prevalence of a PD for those with three or more Axis I disorders was 38.7%.

4. Role impairment

Table 4 shows two models for the association between PDs and impairment. Any PD was only marginally associated with global impairment ($\beta = 1.3$; $p = 0.07$). Any PD was significantly associated with cognitive impairment ($\beta = 1.0$; $p = 0.01$) and only marginally for impairment in social interaction ($\beta = 0.7$; $p = 0.08$). However, when adjusted for any comorbid Axis I disorder, these modest associations disappeared.

5. Treatment

The prevalence of treatment among those meeting criteria for PDs is presented in part I of Table 5. Only 13.5% of those with any PD

Table 2 – Comorbidity with DSM-IV 12-month disorders

12-month disorder	Cluster A		Cluster B		Cluster C		Any	
	OR	95%CI	OR	95%CI	OR	95%CI	OR	95%CI
Any anxiety disorder	4.5*	(2.2; 8.9)	6.5*	(2.1; 20.4)	17.9*	(8.5; 37.7)	7.4*	(4.0; 13.7)
Any mood disorder	5.4*	(2.6; 11.3)	11.1*	(3.4; 36.3)	13.9*	(6.9; 28.0)	7.4*	(4.1; 13.3)
Any impulse disorder	4.7	(0.7; 29.9)	5.9*	(1.0; 36.4)	8.4*	(1.9; 37.1)	4.7*	(1.3; 17.0)
Any substance disorder	3.5*	(1.2; 10.2)	23.7*	(7.0; 79.8)	5.2*	(1.5; 17.7)	5.0*	(1.5; 17.0)
Exactly one disorder	3.5*	(1.4; 9.0)	10.3*	(2.5; 43.1)	7.0*	(1.8; 26.5)	4.2*	(1.9; 9.3)
Exactly two disorders	7.1*	(2.1; 24.7)	32.3*	(9.8; 106.8)	23.0*	(6.7; 79.0)	12.2*	(5.8; 25.7)
Three or more disorders	9.2*	(3.4; 25.0)	35.5*	(6.1; 206.8)	58.4*	(20.8; 163.9)	19.3*	(7.7; 48.2)
Any disorder	4.7*	(2.1; 10.6)	17.2*	(4.8; 61.5)	14.1*	(5.2; 38.2)	6.8*	(3.7; 12.5)

Odds ratios based on logistic regression model adjusted for age and sex
Exactly one, exactly two, and three or more fit simultaneously in a single model. The reference group is no Axis I disorders.
Any anxiety, mood, impulse, substance, and any disorder fit in separate models.
** Significance at the 0.05 level.*

Table 3 – Conditional prevalence with DSM-IV 12-month disorders

12-month disorder	Cluster A				Cluster B				Cluster C				Any			
	Row		Column		Row		Column		Row		Column		Row		Column	
	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
Any anxiety disorder	11.4	2.4	20.6	4.9	6.5	2.1	34.6	10.5	14.4	2.8	50.0	8.2	21.7	3.4	29.0	4.2
Any mood disorder	13.7	3.2	15.0	4.0	9.3	2.8	30.3	10.1	16.4	3.2	34.5	7.1	23.7	3.6	19.2	3.3
Any impulse disorder	20.2	11.0	3.3	2.0	11.4	7.7	5.6	4.3	15.0	7.4	4.8	2.4	25.2	10.1	3.1	1.3
Any substance disorder	20.3	6.5	14.6	5.4	20.3	6.0	42.8	10.4	11.2	5.4	15.1	6.4	29.4	9.1	15.6	5.2
Exactly one disorder	10.2	2.8	20.5	6.0	5.2	1.9	30.6	9.4	6.1	2.4	23.4	8.9	14.3	3.4	21.3	5.1
Exactly two disorders	16.1	5.4	10.1	3.9	13.8	4.6	25.1	7.6	15.7	5.7	18.5	6.4	28.8	5.7	13.3	3.1
Three or more disorders	19.7	5.7	7.1	2.3	14.7	5.4	15.7	6.5	31.3	7.1	21.6	6.1	38.7	7.9	10.2	2.4
Any disorder	12.6	2.3	37.6	8.2	8.1	1.8	71.4	11.7	11.1	2.2	63.5	10.9	20.3	2.9	44.7	6.4

Row percentages represent percents of respondents with each Axis I disorder who meet criteria for the personality disorder.
Column percentages represent percents of respondents with the personality disorder that meet criteria for the Axis I disorder.

reported receiving treatment for problems with their mental health or substance use in the prior 12 months. Those with Cluster B disorders received more treatment (20.9%) than those with Cluster C (16.5%) or Cluster A (14.1%) disorders. Treatment was most commonly received in mental health specialty settings (6.9%) and least commonly from human services (0.6%).

Parts II and III of Table 5 present the results of two separate models for treatment, part II adjusted for sex and age and part III adjusted for sex, age and any Axis I disorder. While respondents with PDs were consistently more likely to receive treatment in comparison to those without PDs across the three PD clusters (ORs range from 4.2 for Cluster C to 6.0 for Cluster B), this strong association became statistically insignificant when Axis I disorders were included in the second model, suggesting that treatment is sought for the Axis I disorder and not for the PD.

Discussion

These first nationally representative estimates of PDs in the Mexican adult population suggest that one in every 17 persons meets criteria for at least one PD with a greater frequency of Cluster A disorders, and a significant co-occurrence of PDs and DSM-IV Axis I disorders. While one fifth of those with an Axis I disorder also meet criteria for a PD, almost half of those with a PD meet criteria for an Axis I disorder. Modest associations of PDs with impairment and strong associations with treatment utilization were largely accounted for by Axis I comorbidity suggesting that the public health significance of PDs lies in their comorbidity with, and perhaps effects upon, Axis I disorders rather than their direct effects on functioning and help seeking.

These estimates are similar but slightly lower than those in the U.S. population using the same screening questions and imputation method.[6] While any PD was present in 9.1% of the U.S. adult population and only 6.1% of the Mexican adult population, this difference is due mostly to a greater prevalence of Cluster C in the U.S. population (6.0% versus 2.4%). This prevalence estimate is consistent with but in the lower range of most community studies in other countries and only higher than one study from Great Britain.[2,4,5,9]

While most international studies have not found consistent sex differences in the overall prevalence of PDs, studies have suggested different sex ratios for specific PDs, such as a lower prevalence of antisocial PD and greater prevalence of dependent, avoidant and paranoid PD in females and greater overall Cluster A and Cluster B disorders in males.[4,5] This is consistent with our finding of overall lower rates in females, particularly in Cluster A disorders.

Age and education have been found to be inversely associated with PDs in some but not all studies.[4,8,9] Our association of age with Cluster B is consistent with those findings of Samuels et al. in a U.S. sample and might be explained by greater antisocial personality (ASP) and borderline personality in younger persons or possibly a cohort effect such that younger cohorts might be more likely to develop Cluster B disorders.[5] A previous survey in the general adult population of Mexico, which included a screening instrument for ASP, reported 1.8% classified as possible ASP cases with a greater proportion of ASP cases in males but no significant age effect.[30] The prevalence of probable PD in another general population survey of adults in Mexico City reports a slightly lower prevalence of males

Table 4 – Impairment associated with personality disorders

Model	WHO-DAS	Cluster A			Cluster B			Cluster C			Any		
		Beta	SE	p-value	Beta	SE	p-value	Beta	SE	p-value	Beta	SE	p-value
I	Self care	0.3	0.8	0.68	0.2	0.2	0.48	0.2	0.9	0.85	0.3	0.6	0.64
	Cognition	0.9	0.5	0.05	1.3	1.1	0.23	1.7	1.3	0.17	1.0	0.4	0.01
	Mobility	0.8	1.0	0.42	0.3	1.3	0.80	1.8	1.6	0.27	0.9	1.2	0.45
	Role functioning	3.2	2.0	0.11	5.5	3.8	0.15	6.1	3.7	0.10	3.8	2.3	0.10
	Social interaction	0.8	0.6	0.18	0.4	0.4	0.36	1.3	1.2	0.27	0.7	0.4	0.08
	Global	1.2	0.8	0.13	1.5	1.1	0.18	2.2	1.4	0.11	1.3	0.7	0.07
II	Self care	0.3	0.9	0.76	-0.1	0.2	0.83	0.0	1.0	0.98	0.2	0.7	0.78
	Cognition	0.5	0.4	0.23	0.3	1.1	0.78	0.9	1.3	0.48	0.5	0.4	0.21
	Mobility	0.4	1.0	0.72	-0.8	1.3	0.54	0.9	1.6	0.59	0.3	1.3	0.82
	Role functioning	2.0	2.0	0.32	2.7	3.7	0.47	3.7	3.7	0.31	2.2	2.3	0.34
	Social interaction	0.6	0.6	0.30	-0.1	0.5	0.76	0.9	1.2	0.45	0.4	0.4	0.27
	Global	0.7	0.8	0.35	0.4	1.1	0.72	1.3	1.4	0.36	0.7	0.7	0.33

Model I adjusted for age and sex
Model II adjusted for age, sex and any Axis I disorder
P-value is from a Wald Chi-Square test

than females (1.7% of males and 2.0% of females) and a more elevated prevalence in those aged 18 to 24 than older respondents.[31] Research on antisocial conduct rather than ASP in student samples in Mexico City suggests an increase in such behaviors. In 1997, 24% of middle school and high school students reported having engaged in any antisocial behavior (theft and violence) of which almost 5% engaged in any serious antisocial behavior (such as major theft, property destruction, using a weapon, selling drugs, etc.) compared to 33% and 7%, respectively, in 2003.[32]

Education in this current survey is found to be inversely related to PDs similar to data from the U.S. and Norway.[4,6,8] Whether this can be attributed to PDs interfering with one's ability to progress successfully through the educational system or to the protective nature of education upon personality formation cannot be determined from this study.

Our finding that PD's association with role impairment and treatment utilization disappears when Axis I disorders are taken into account is similar to the findings of Lenzenweger et al. with a U.S. sample using similar methodology, but is quite different from that from Australia in which PDs were predictors of most measures of disability and service use above and beyond Axis I disorders.[6,18] Possible explanations for this inconsistency might include variation in tolerance for personality dysfunction in different cultures or differences in the health services system in different countries.

These results should be interpreted with caution and considered a first approximation to understanding the epidemiology of PDs in Mexico, as the full IPDE was not applied in the Mexican survey and imputation procedures were based on US clinical reappraisal data. It is possible that the screening items do not correspond to clinical evaluations in the Mexican population in the same fashion as they do in the U.S. Also there are concerns that the latent structure of the DSM-IV criteria for PDs does not adequately represent personality pathology, which may be better defined by five distinct PD symptom dimensions.[33] However, this is an issue that is beyond the scope of this report. Because non-affective psychosis and obsessive compulsive disorder were not included in the Axis I disorders evaluated, our estimates of comorbidity are likely to be conservative. Additionally, these analyses are based on cross-sectional data and are not indicative of causal or temporal interpretations. In order to develop further our understanding of PDs in the Mexican population in particular and the developing world in general, subsequent research should utilize the full IPDE in a representative sample of the general population, as well as incorporate longitudinal studies in order to evaluate the temporal ordering and persistence of PDs with Axis I disorders and their impact upon disorder course, treatment utilization and treatment response. Including cultural factors might shed light upon the different prevalence of cluster types in different cultural contexts. The importance of these data lies in beginning to fill a void of information regarding PDs in different cultures and regions of the world, especially given the current debate over PDs in the DSM nomenclature as to whether their separation from Axis I disorders is valid or not and whether indeed they are distinct entities or only chronic variants of Axis I disorders.

Conclusions

In Mexico, as elsewhere, PDs are frequent and highly comorbid with DSM Axis I psychiatric disorders. Since at least one in every five persons with an Axis I disorder in Mexico is likely to have a comorbid PD and almost one in every two persons with a PD is

Table 5 – Prevalence of 12-month treatment among those with personality disorders (part I) and odds ratios of treatment among those with personality disorders compared with those without (part II) and with controls for comorbid Axis I disorders (part III)

	Cluster A		Cluster B		Cluster C		Any	
I. Treatment prevalence	**%**	**(SE)**	**%**	**(SE)**	**%**	**(SE)**	**%**	**(SE)**
Psychiatrist	4.0	(2.4)	6.1	(6.6)	4.1	(2.9)	3.9	(2.1)
Other mental health	3.9	(1.9)	6.1	(3.5)	3.6	(2.5)	3.7	(1.7)
Any mental health	7.2	(2.9)	11.8	(7.0)	7.4	(3.9)	6.9	(2.5)
General medical	4.0	(1.8)	4.8	(3.3)	5.9	(3.1)	3.9	(1.6)
Human service	0.3	(0.3)	0.6	(1.4)	0.7	(0.7)	0.6	(0.5)
CAM	4.4	(3.3)	4.8	(5.2)	5.5	(3.9)	4.1	(2.3)
Any treatment	14.1	(4.9)	20.9	(7.8)	16.5	(5.5)	13.5	(3.6)
II. Unadjusted odds of treatment	**OR**	**(95% CI)**	**OR**	**(95% CI)**	**OR**	**(95% CI)**	**OR**	**(95% CI)**
Psychiatrist	6.1*	(1.1; 35.6)	6.9	(0.4; 114.4)	5.2	(0.7; 36.3)	6.4*	(1.3; 30.5)
Other mental health	3.4*	(1.0; 11.4)	3.8	(0.9; 16.1)	2.1	(0.4; 10.9)	2.5	(0.7; 8.8)
Any mental health	4.4*	(1.6; 11.8)	5.4*	(1.3; 23.4)	3.3	(0.9; 11.9)	3.6*	(1.4; 9.3)
General medical	3.8*	(1.1; 12.8)	4.1	(0.8; 22.2)	3.8*	1.1; 12.7)	3.3*	(1.2; 9.0)
Human service	1.4	(0.1; 18.9)	3.6	(0.1; 101.2)	2.3	(0.2; 22.2)	2.2	(0.2; 24.7)
CAM	4.4	(0.4; 45.0)	4.4	(0.4; 49.6)	5.9*	(1.1; 33.0)	4.7*	(0.9; 23.2)
Any treatment	4.5*	(1.6; 12.9)	6.0*	(1.9; 18.6)	4.2*	(1.8; 9.8)	4.0*	(1.8; 8.6)
III. Adjusted odds of treatment	**OR**	**(95% CI)**	**OR**	**(95% CI)**	**OR**	**(95% CI)**	**OR**	**(95% CI)**
Psychiatrist	2.8	(0.5; 17.8)	1.9	(0.1; 34.3)	1.4	(0.2; 11.6)	2.5	(0.5; 13.2)
Other mental health	1.9	(0.5; 7.1)	1.6	(0.4; 6.3)	0.8	(0.1; 4.6)	1.3	(0.4; 4.4)
Any mental health	2.4	(0.8; 7.0)	2.0	(0.5; 8.5)	1.2	(0.3; 4.8)	1.7	(0.7; 4.2)
General medical	2.1	(0.6; 7.6)	1.6	(0.3; 8.2)	1.4	(0.4; 4.6)	1.5	(0.5; 4.7)
Human service	1.1	(0.1; 14.2)	2.6	(0.1; 90.4)	1.6	(0.2; 16.3)	1.7	(0.1; 21.1)
CAM	2.9	(0.2; 33.2)	1.8	(0.1; 24.3)	2.8	(0.5; 15.9)	2.8	(0.5; 16.6)
Any treatment	2.6	(0.8; 8.1)	2.2	(0.8; 6.1)	1.5	(0.7; 3.6)	2.0	(0.9; 4.4)

*Part II adjusted for age and sex only; part III adjusted for age, sex, and any Axis I disorder; * Significance at the 0.05 level*

likely to have an Axis I disorder, the management of both and the implications for treatment planning must be taken into account in clinical practice.

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** Modest*
*** Significant*
**** Significant. Amounts given to the author's institution or to a colleague for research in which the author has participation, not directly to the author.*
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References

1. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV). Fourth Edition. Washington, DC: American Psychiatric Association; 1994.
2. Coid J, Yang M, Tyrer P, Roberts A, Ullrich S. Prevalence and correlates of personality disorder in Great Britain. *Br J Psychiatry*. 2006;188:423-31.
3. Crawford TN, Cohen P, Johnson JG, Kasen S, First MB, Gordon K, Brook JS. Self-reported personality disorder in the children in the community sample: convergent and prospective validity in late adolescence and adulthood. *J Personality Dis*. 2005;19(1):30-52.
4. Grant BF, Hasin DS, Stinson FS, Dawson DA, Chou SP, Ruan WJ, Pickering RP. Prevalence, correlates, and disability of personality disorders in the United States: results from the national epidemiologic survey on alcohol and related conditions. *J Clin Psychiatry*. 2004;65(7):948-58.
5. Samuels J, Eaton WW, Bienvenu OJ 3rd, Brown CH, Costa PT Jr, Nestadt G. Prevalence and correlates of personality disorders in a community sample. *Br J Psychiatry.* 2002;180:536-42.
6. Lenzenweger MF, Lane MC, Loranger AW, Kessler RC. DSM-IV personality disorders in the National Comorbidity Survey Replication. *Biol Psychiatry*. 2008;62(6):553-64.
7. Maier W, Lichtermann D, Klingler T, Heun R, Hallmayer J. Prevalence of personality disorders (DSM-III.R) in the community. *J Personal Disord*. 1992;6(3):187-96.
8. Torgersen S, Kringlen E, Cramer V. The prevalence of personality disorders in a community sample. *Arch Gen Psychiatry*. 2001;58(6):590-6.
9. Jackson HJ, Burgess PM. Personality disorders in the community: a report from the Australian National Survey of Mental Health and Wellbeing. *Soc Psychiatry Psychiatr Epidemiol*. 2000;35(12):531-8.
10. Goodwin RD, Brook JS, Cohen P. Panic attacks and the risk of personality disorder. *Psychol Med*. 2005;35(2):227-35.
11. Grant BF, Hasin DS, Stinson FS, Dawson DA, Patricia Chou S, June Ruan W,, Huang B. Co-occurrence of 12-month mood and anxiety disorders and personality disorders in the US: results from the national epidemiologic survey on alcohol and related conditions. *J Psychiatr Res*. 2005;39(1):1-9.
12. Johnson JG, Cohen P, Kasen S, Brook JS. Personality disorder traits associated with risk for unipolar depression during middle adulthood. *Psychiatry Res*. 2005;136(2-3):113-21.
13. Johnson JG, First MB, Cohen P, Skodol AE, Kasen S, Brook JS. Adverse outcomes associated with personality disorder not otherwise specified in a community sample. *Am J Psychiatry*. 2005;162(10):1926-32.
14. Skodol AE, Gunderson JG, McGlashan TH, Dyck IR, Stout RL, Bender DS, Grilo CM, Shea MT, Zanarini MC, Morey LC, Sanislow CA, Oldham JM. Functional impairment in patients with schizotypal, borderline, avoidant, or obsessive-compulsive personality disorder. *Am J Psychiatry*. 2002;159(2):276-83.
15. Bender DS, Dolan RT, Skodol AE, Sanislow CA, Dyck IR, McGlashan TH, Shea MT, Zanarini MC, Oldham JM, Gunderson JG. Treatment utilization by patients with personality disorders. *Am J Psychiatry*. 2001;158(2):295-302.
16. Miller JD, Pilkonis PA, Mulvey EP. Treatment utilization and satisfaction: examining the contributions of Axis II psychopathology and the five-factor model of personality. *J Personal Disord*. 2006;20(4):369-87.
17. Moran P, Rendu A, Jenkins R, Tylee A, Mann A. The impact of personality disorder in UK primary care: a 1-year follow-up of attenders. *Psychol Med*. 2001;31(8):1447-54.
18. Jackson HJ, Burgess PM. Personality disorders in the community: results from the Australian National Survey of Mental Health and Wellbeing Part II. Relationships between personality disorder, Axis I mental disorders and physical conditions with disability and health consultations. *Soc Psychiatry Psychiatr Epidemiol*. 2002;37(6):251-60.
19. Paez F, Rodriguez R, Perez V, Colmenares E, Coello F, Apiquian R, Dickinson ME, Ponce RR, Nicolini H. Prevalencia comunitaria de los trastornos de la personalidad. Resultados de un estudio piloto [Community prevalence of personality disorders. Results of a pilot study]. *Salud Mental*. 1997;20:19-23.
20. Medina-Mora ME, Borges G, Benjet C, Lara C, Berglund P. Psychiatric disorders in Mexico: lifetime prevalence nationally representative sample. *Br J Psychiatry*. 2007;190(6):521-8.
21. Medina-Mora ME, Borges G, Lara C, Benjet C, Blanco J, Fleiz C, Villatoro J, Rojas E, Zambrano J. Prevalence, service use, and

demographic correlates of 12-month DSM-IV Psychiatric Disorders in Mexico: results from the Mexican National Comorbidity Survey. *Psychol Med*. 2005;35(12):1773-83.
22. Kessler RC, Üstün TB. The World Mental Health (WMH) Survey Initiative Version of the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI). *Int J Methods Psychiatr Res*. 2004;13(2):93-121.
23. Lenzenweger MF. Stability and change in personality disorder features: the Longitudinal Study of Personality Disorders. *Arch Gen Psychiatry*. 1999;56(11):1009-15.
24. Lenzenweger MF, Loranger AW, Korfine L, Neff C. Detecting personality disorders in a nonclinical population. Application of a 2-stage procedure for case identification. *Arch Gen Psychiatry*. 1997;54(4):345-51.
25. Rubin DB. *Multiple Imputation for Nonresponse in Surveys*. New York, NY: John Wiley & Sons; 1897.
26. Haro JM, Arbabzadeh-Bouchez S, Brugha TS, de Girolamo G, Guyer ME, Jin R, Lepine JP, Mazzi F, Reneses B, Vilagut G, Sampson NA, Kessler RC. Concordance of the Composite International Diagnostic Interview Version 3.0 (CIDI 3.0) with standardized clinical assessments in the WHO World Mental Health surveys. *Int J Methods Psychiatr Res*. 2006;15(4):167-80.
27. Chwastiak LA, Von Korff M. Disability in depression and back pain: evaluation of the World Health Organization Disability Assessment Schedule (WHO DAS II) in a primary care setting. *J Clin Epidemiol*. 2003;56(6):507-14.
28. Wolter KM. *Introduction to Variance Estimation*. New York, NY: Springer-Verlag; 1985.
29. SUDAAN: Professional Software for Survey Data Analysis, version [computer program] 8.0.1. Research Triangle Park, NC: Research Triangle Institute; 2002.
30. Benjet C, Borges G, Wagner F, Medina-Mora ME. Psychometric properties and construct validity of a Spanish language scale for screening antisocial personality. *Soc Behav Personal*. 2002;30(2):223-34.
31. Caraveo-Anduaga J, Medina-Mora ME, Rascón ML, Villatoro J, Martínez-Vélez A, Gómez M. La prevalencia de los trastornos psiquiátricos en la población urbana adulta en México [The prevalence of psychiatric disorders in the urban adult population in Mexico]. *Salud Mental*. 1996;19(3):14-21.
32. Juárez García F, Villatoro JA, Gutiérrez ML, Fleiz C, Medina-Mora ME. Tendencias de la conducta antisocial en estudiantes del Distrito Federal: mediciones 1997-2003. *Salud Mental.* 2005;28(1):60-8.
33. Nestadt G, Hsu FC, Samuels J, Bienvenu OJ, Reti I, Costa PT Jr, Eaton WW. Latent structure of the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition personality disorder criteria. *Compr Psychiatry*. 2006;47(1):54-62.