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RESEARCH ARTICLE

Irritability as an important non-specific symptom to evaluate in childhood mental health

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ABSTRACT

Objective: To examine the symptom irritability reported in Mexican children aged four to twelve in a series of studies at general practice and in the general population using the Brief Screening and Diagnosis Questionnaire (CBTD for its initials in Spanish) in order to identify probable syndromes and its association with internalizing and externalizing problems.

Material and Methods: A combined base of six studies (N=1,881) carried out between 2005 and 2018 was compared with the 1995 population study at Mexico City (N=1,223). The total prevalence of three probable irritability syndromes was obtained for sex and age group. The strength of the association between these irritability syndromes and internalizing and externalizing problems as defined by the CBTD was obtained.

Results: Irritability was six to eleven times higher than in 1995, prevailing in the most symptomatic cases. The association with externalizing syndromes was three to four times higher and two to six times higher with internalizing syndromes.

Conclusions: The three syndrome definitions seem to adequately address childhood irritability detecting clinically significant cases and those most in need of care.

Keywords: mental health; children; symptoms; syndromes; psychopathology; questionnaire; screening; Mexico.

Introduction

The new paradigm in the study of mental health phenomena focusses on basic phenomena that can be addressed by various disciplines from a developmental perspective¹.

Psychopathology in childhood has been conceived as normal development that has deviated^{2,3}. The identification of traits, signs and particularly symptoms that help detect possible conditions of vulnerability to developing psychopathological problems in children and adolescents therefore constitutes a key study task.

An analysis of various studies on the child and adolescent population of Mexico using the same screening instrument and evaluation procedures showed that over a period of fifteen years, the report of irritability and explosiveness had significantly increased⁴.

Irritability has been defined as the propensity to express anger and frustration and greater sensitivity to external and internal stimuli⁵, or as a state of low tolerance of frustration accompanied by greater outbursts of anger than normative ones⁶. In the DSM-V, irritability is a cardinal symptom for Disruptive Mood Dysregulation Disorder (DMDD)^{7,8}.

Nowadays, a distinction is made between episodic and chronic irritability, both of which are clinically significant and have different psychopathological trajectories⁹. The episodic type is a predisposing factor for generalized anxiety in adolescents and bipolar disorder in adults, whereas chronic irritability in childhood is associated with disruptive behavior problems and can lead to severe mood disorders, unipolar depression, and anxiety disorders in adults^{10,11}. Although irritability in young children is considered

common, the clinically significant or atypical form occurs in 3% of the general population¹².

In a cohort study of children aged three to five followed at three cut-off points, it was found that reports of their becoming easily frustrated and breaking or destroying things during a tantrum constituted the key indicators for defining dysfunctional irritability. Preschoolers with significant irritability maintained high levels at later ages and showed statistically significant differences in meeting the criteria for ODD, DMDD and other DSM-V disorders¹³.

The purpose of this study is to examine the symptom irritability reported in Mexican children aged four to twelve in a series of studies at general practice and in the general population using the Brief Screening and Diagnosis Questionnaire (CBTD for its initials in Spanish) in order to identify a probable irritability syndrome and its association with internalizing and externalizing problems.

Material and Methods

This is a non-experimental, descriptive correlational study. The unit of analyses is the children and preadolescents aged four to twelve years old. For all of them, information was obtained by interviewing one of the parents, or a family member or guardian using the CBTD once prior informed consent had been obtained. The sample for this report comes from six studies in which the CBTD was used. A sample of 671 children, 356 girls and 315 boys with a mean age of 7.8 years (s.d. 2.6) who consecutively sought non-psychiatric medical care was obtained from the study of a health center in Mexico City (2005). A household study conducted in the City of

Durango (2007) yielded information on 153 children 67 girls and 86 boys with a mean age of 7.7 years (s.d. 2.5). In a primary school in the east of Mexico City (2008), information was obtained on 192 children, 95 girls and 97 boys with a mean age of 9.5 (s.d. 1.8). A 2010 study of a boys' elementary school in the State of Mexico provided data on 390 children mean age of 8.9 years (s.d. 2.1). Information was gathered on 248 children, 118 girls and 130 boys with a mean age of 8.1 years (s.d. 2.5) from households in the geographic area served by a psychological care center under the authority of the UNAM Psychology Faculty (2016). Finally, a study conducted at three kindergartens in Mexico City on preschool children (2018) provided data on 227 preschoolers 85 girls and 142 boys with a mean age of 4.7 years (s.d. 0.7). The combined base total for this research was 1,881 children, 721 girls and 1,160 boys. For comparative purposes, information on 1,223 children aged four to twelve from an epidemiologic study conducted in Mexico City in 1995 was used¹⁴.

• INSTRUMENT

The Brief Screening and Diagnosis Questionnaire (CBTD) is an instrument, described in previous publications, comprising twenty-seven valid, reliable dichotomous items, which allows the identification of potentially relevant syndrome profiles for both clinical and epidemiological research¹⁵⁻¹⁸.

• STATISTICAL ANALYSIS

The irritability symptom was initially used as the dependent variable and the other twenty-six CBTD symptoms as independent, adjusting for age groups (4-5; 6-8; 9-12) to

identify the strength of association and its constancy. The two symptoms showing an early, significant association with irritability were explosiveness and isolation. Dependent variables were therefore created with these symptoms regarded as nuclear or cardinal. These new variables were subsequently subjected to logistic regression analysis versus the rest of the symptoms in the questionnaire to strengthen the algorithms with "additional symptoms" showing a significant association. Finally, the incidence risk ratio, IRR, was examined with the prospective information at two years follow-up of the study at the health center to have greater certainty about the associations found.

The distribution of irritability syndromes was examined considering the number of CBTD symptoms and respective cut-off points defining caseness: 0-4 symptoms non-cases; 5-8 non-complicated cases, and 8 or more symptoms complicated cases.

The total prevalence, by sex and age group, was obtained¹⁴ for the three proposed syndrome definitions of irritability, both from the base of combined studies and the population sample of the 1995 benchmark study, comparing it using the X^2 test. It was also used to compare the prevalence of irritability in each of the groups of probable disorders.

Logistic regression analysis was used to examine the effect of the irritability syndrome as a whole, as well as each specific definition (independent variable) as a predictor of the other syndromes constructed with the CBTD (dependent variables). Models were constructed for each of the internalized, externalized, and other syndromes, and also included gender and age group as independent variables.

SPSS 21.0* was used to obtain prevalence and comparison tests while Stata 13.0** was used for logistic regression analyses.

Results

OPERATIONAL DEFINITIONS OF IRRITABILITY SYNDROMES

Three syndrome definitions of irritability were developed from the analyses with the CBTD data:

IRN1 Nuclear symptoms: Irritable, explosive, and isolated plus two of the following: frequent headaches, sad, distracted.

IRN2 Nuclear symptoms: Irritable, isolated, plus at least one of the following: abnormal language, nervous, dependent, distracted.

IRN3 Nuclear symptoms: Irritable, explosive, plus two of the following: nervous, restless, disobedient.

The current study sample was 61.7% male, while the average age was 7.9 years (S.D.2.6); with 25.0% aged four to five, 32.2% aged six to eight and 42.8% aged nine to twelve. Fifteen per cent of the total presented IRN3 syndrome, whereas for IRN1 and IRN2, the percentage was 2.3% in each. Statistically significant differences were found by sex. IRN1 and IRN2 were more frequent in girls ($X^2 = 6.514$, $p = 0.011$; $X^2 = 4.277$, $p = 0.039$), whereas IRN3 was more frequent in boys ($X^2 = 7.124$, $p = 0.008$).

The prevalence of irritability syndromes in the pooled sample was higher than in the 1995

study. An eleven-fold increase was observed for IRN1 and IRN2, together with a six-fold increase for IRN3. By sex, greater increases were observed in girls than boys in comparison with their counterparts measured in 1995 (Table I).

* IBM Corp. SPSS Statistics Software: Released 21. Armonk, NY: IBM Corp, 2012.

**Stata Corp. Stata Statistical Software: Released 13. College Station, TX: Stata Corp LP, 2013.

Table I: COMPARISON OF PREVALENCE OF PROBABLE IRRITABILITY SYNDROME IN CHILDREN (1995-2018) BY SEX. MEXICO

	Girls				Boys				Total			
	Current study %	Mexico City 1995 %	X ²	p	Current study %	Mexico City 1995 %	X ²	p	Current study %	Mexico City 1995 %	X ²	p
	(n=721)	(n=591)			(n=1,160)	(n=632)			(n=1,881)	(n=1,223)		
IRN1	3.5	0.0	20.890	0.000 [§]	1.6	0.5	4.565	0.033*	2.3	0.2	21.790	0.000 [§]
IRN2	3.2	0.2	16.503	0.000 [§]	1.7	0.3	6.685	0.010 [†]	2.3	0.2	21.140	0.000 [§]
IRN3	12.2	1.5	54.131	0.000 [§]	16.7	3.3	69.589	0.000 [§]	15.0	2.5	128.883	0.000 [§]

*p <.05, †p ≤ .01, §p <.001 IRN1: Nuclear symptoms: irritable, explosive and isolated plus two of the following: frequent headaches, sad, distracted IRN2: Nuclear symptoms: Irritable, isolated plus at least one of the following: abnormal language, nervous, dependent, distracted IRN3: Nuclear symptoms: Irritable, explosive; plus two of the following: nervous, restless, disobedient

Significant, robust increases were found in the prevalence of the three syndrome definitions of irritability by age group compared to 1995. INR3 showed eight-fold increase in pre-school children

and nearly six-fold increases in the two groups of school age children (Table II).

Table II: COMPARISON OF PREVALENCE OF PROBABLE IRRITABILITY SYNDROME IN CHILDREN (1995-2018) BY AGE GROUP. MEXICO

	4 to 5 years				6 to 8 years				9 to 12 years			
	Current study %	Mexico City 1995 %	X ²	p	Current study %	Mexico City 1995 %	X ²	p	Current study %	Mexico City 1995 %	X ²	p
	(n=470)	(n=274)			(n=605)	(n=430)			(n=806)	(n=519)		
IRN1	1.3	0.0	3.526	0.060	2.0	0.2	6.213	0.013*	3.2	0.4	12.314	0.000 [§]
IRN2	2.6	0.0	7.110	0.008 [†]	2.0	0.2	6.213	0.013*	2.4	0.4	7.871	0.005 [†]
IRN3	14.3	1.8	30.598	0.000 [§]	13.1	2.3	36.835	0.000 [§]	16.9	2.9	61.135	0.000 [§]

*p < .05, †p <.01, §p <.001 IRN1: Nuclear symptoms: Irritable, explosive and isolated plus two of the following: frequent headaches, sad, distracted IRN2: Nuclear symptoms: Irritable, isolated, plus at least one of the following: abnormal language, nervous, dependent, distracted IRN3: Nuclear symptoms: Irritable, explosive plus two of the following: nervous, restless, disobedient

A total of 59.6% of the cases with any of the definitions of probable irritability syndromes were in the most symptomatic and thus complicated cases as defined by the cut-off points on the CBTD.

A comparative analysis of the presence/absence of each irritability syndrome in relation to each of the CBTD syndromes

is shown in Table III. It is striking, for example, that in children with internalization syndromes, although the three syndrome definitions of irritability are significantly present, IRN2 definition is almost exclusive. Conversely, the definition that includes irritability and explosiveness as nuclear symptoms, IRN3, is significantly present in each of the CBTD syndromes.

Table III: COMPARISON OF PREVALENCE OF EXTERIORIZING, INTERIORIZING AND OTHER SYMPTOMS IN CHILDREN WITH AND WITHOUT THE PRESENCE OF PROBABLE IRRITABILITY SYNDROME, MEXICO 2018

	IRN1				IRN2				IRN3			
	Meets criterion	Does not meet criterion	X ²	p	Meets criterion	Does not meet criterion	X ²	p	Meets criterion	Does not meet criterion	X ²	p
	%	%			%	%			%	%		
Exteriorizing[†]												
Combined attention deficit and hyperactivity	56.8	13.7	63.566	< 0.001	--	--	--	--	50.4	8.4	335.332	< 0.001
Attention deficit hyperactivity- impulsiveness type	--	--	--	--	--	--	--	--	32.6	4.9	224.486	< 0.001
Oppositional defiant behavior	63.6	19.8	50.239	< 0.001	--	--	--	--	64.5	13.1	385.659	< 0.001
Serious behavior problem	--	--	--	--	--	--	--	--	24.8	3.9	161.174	< 0.001
Moderate behavior problem	--	--	--	--	--	--	--	--	14.9	3.6	61.705	< 0.001
Accentuated explosiveness trait	43.2	13.9	29.644	< 0.001	--	--	--	--	60.6	6.4	565.805	< 0.001

	IRN1				IRN2				IRN3			
Interiorizing[‡]												
Generalized anxiety	68.2	18.6	66.818	< 0.001	37.2	19.3	8.498	0.004*	66.0	11.6	447.855	< 0.001
Anxiety with inhibition	61.4	15.5	65.612	< 0.001	34.9	16.1	10.737	0.001*	34.0	13.4	73.692	< 0.001
Severe depressive condition 2 cardinal symptoms	86.4	10.2	236.829	< 0.001	41.9	11.3	37.355	< 0.001	33.3	8.2	143.879	< 0.001
Severe depressive condition 1 cardinal symptom	--	--	--	--	32.6	16.2	8.188	0.004*	48.2	10.9	241.457	< 0.001
Other[‡]												
Serious language problem	--	--	--	--	--	--	--	--	15.6	7.8	17.769	< 0.001
Epilepsy	--	--	--	--	--	--	--	--	17.7	3.1	101.564	< 0.001
Explosiveness with organic origin	--	--	--	--	--	--	--	--	16.7	1.9	133.575	< 0.001

* $p < .01$ † Variables for syndromes constructed on the basis of the criteria in the Brief Screening and Diagnosis Questionnaire (BSDQ) Guidelines IRN1: Nuclear symptoms: Irritable, explosive and isolated and two of the following: frequent headaches, sad, distracted. IRN2: Nuclear symptoms: Irritable, isolated, plus at least one of the following: abnormal language, nervous, dependent, distracted IRN3: Nuclear symptoms: irritable, explosive, plus two of the following: nervous, restless, disobedient

Finally, Table IV presents the results of the strength of association of irritability as a whole and that of each definition used, as well as by gender and age groups. In externalization problems, children with irritability syndrome are nearly four times more likely to present a combined type of attention-deficit/hyperactivity problem, mainly in males with IRN1 and IRN3, without significant differences by age. They are nearly three times more likely to present hyperactive-impulsive type

manifestations, particularly preschool children and those with IRN3, and nearly four times more likely to present oppositional behavior, particularly boys. Both sexes are likely to present serious behavior problems, according to the IRN1 and IRN3 definitions. Older schoolchildren are sixty-two per cent more likely to present moderate behavioral problems and nearly seven times more likely to display explosiveness as a marked behavioral trait except those meeting the definition for IRN2.

Table IV: PREDICTORS OF EXTERIORIZING, INTERIORIZING AND OTHER SYNDROMES, MEXICO 2018.

Predictors	Combinated attention deficit and hyperactivity			Attention deficit hyperactivity and impulsiveness type			Oppositional behavior			Serious behavior problem		
	OR#	p	CI 95 %	OR#	p	CI 95 %	OR#	p	CI 95 %	OR#	p	CI 95 %
Probable irritability syndrome [§]	3.866	< 0.001	2.864-5.218	2.948	< 0.001	2.055-4.231	3.991	< 0.001	2.997-5.316	3.931	< 0.001	2.646-5.841
IRN1	6.128	< 0.001	3.208-11.703	0.205	0.121	0.028-1.521	4.897	< 0.001	2.544-9.427	8.548	< 0.001	4.275-17.094
IRN2	0.430	0.170	0.129-1.437	0.227	0.148	0.030-1.692	0.654	0.330	0.278-1.537	0.377	0.343	0.050-2.830
IRN3	4.340	< 0.001	3.155-5.971	4.096	< 0.001	2.822-5.945	4.823	< 0.001	3.525-6.598	3.940	< 0.001	2.601-5.969
Female Male	1.594	0.006 [‡]	1.146-2.218	0.922	0.681	0.627-1.357	1.387	0.035 [*]	1.024-1.878	1.407	0.116	0.919-2.154
4 to 5 years 6 to 8 years	0.992	0.970	0.659-1.493	0.609	0.036 [*]	0.384-0.967	1.284	0.193	0.881-1.871	1.557	0.116	0.896-2.707
9 to 12 years	1.047	0.813	0.715-1.532	0.472	0.001 [‡]	0.303-0.734	0.849	0.371	0.592-1.216	1.492	0.131	0.887-2.510
	Moderate behavior problem			Accentuated explosiveness trait			Serious depressive condition 2 cardinal symptoms			Serious depressive condition 1 cardinal symptom		
Probable irritability syndrome [§]	1.625	0.025 [*]	1.063-2.485	6.992	< 0.001	5.070-9.643	4.495	< 0.001	3.247-6.224	2.092	< 0.001	1.576-2.777
IRN1	1.517	0.377	0.602-3.823	4.631	< 0.001	2.414-8.885	38.266	< 0.001	15.474-94.630	0.398	0.042	0.164-0.966
IRN2	0.652	0.568	0.151-2.824	--	--	--	7.164	< 0.001	3.477-14.762	1.492	0.273	0.729-3.052

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IRN3	1.770	0.012*	1.133- 2.766	9.813	< 0.001	6.953- 13.849	3.150	< 0.001	2.215- 4.480	2.665	< 0.001	1.966- 3.613
Female Male	1.151	0.546	0.730- 1.815	0.903	0.566	0.637- 1.280	1.063	0.737	0.745- 1.515	0.720	0.031*	0.535- 0.970
4 to 5 years 6 to 8 years	0.950	0.875	0.500- 1.805	1.137	0.577	0.725- 1.782	1.576	0.068	0.967- 2.568	0.904	0.599	0.619- 1.319
9 to 12 years	1.853	0.028*	1.068- 3.217	1.175	0.449	0.774- 1.784	2.430	< 0.001	1.553- 3.803	0.963	0.836	0.677- 1.371
	Generalized anxiety			Anxiety with inhibition			Epilepsy			Serious language problem		
Probable irritability syndrome [§]	6.202	< 0.001	4.612- 8.341	1.586	0.002 [‡]	1.193- 2.109	3.799	< 0.001	2.432- 5.936	1.148	0.434	0.812- 1.624
IRN1	6.834	< 0.001	3.495- 13.363	4.256	< 0.001	2.229- 8.128	8.121	< 0.001	3.915- 16.845	2.309	0.019*	1.148- 4.643
IRN2	2.823	0.004 [‡]	1.402- 5.682	1.766	0.113	0.874- 3.568	1.511	0.515	0.437- 5.225	2.251	0.036*	1.054- 4.807
IRN3	6.812	< 0.001	4.938- 9.395	1.332	0.072	0.975- 1.820	3.578	< 0.001	2.230- 5.740	0.902	0.607	0.609- 1.337
Female Male	0.848	0.300	0.621- 1.158	0.916	0.560	0.681- 1.231	0.943	0.798	0.601- 1.480	1.234	0.261	0.855- 1.780
4 to 5 years 6 to 8 years	1.163	0.459	0.780- 1.735	0.793	0.208	0.553- 1.138	1.319	0.368	0.722- 2.411	0.610	0.024*	0.397- 0.938
9 to 12 years	1.379	0.091	0.950- 2.002	0.520	< 0.001	0.366- 0.739	1.247	0.445	0.708- 2.197	0.506	0.001 [‡]	0.335- 0.764

* $p < .05$, [‡] $p < .01$ [§] Variable that includes subjects who met the criteria for any of the definitions of probable irritability syndrome proposed # Adjusted for every clinical condition explored IRN1: Nuclear symptoms: irritable, explosive and isolated and two of the following: frequent headaches, sad, distracted IRN2: Nuclear symptoms: Irritable, isolated, plus at least one of the following: abnormal language, nervous, dependent, distracted IRN3: Nuclear symptoms: Irritable, explosive, plus two of the following: nervous, restless, disobedient CI 95 %: Confidence interval for 95%

For internalization problems, in children with irritability syndrome, the probability of presenting a severe depressive condition with two cardinal symptoms is 4.5 times higher than for their peers without irritability syndrome and increases with age. Likewise, presenting a severe depressive condition with one cardinal symptom is twice as likely in girls with IRN3 syndrome as in their peers without irritability. The probability of presenting manifestations of generalized anxiety and anxiety with inhibition increases six-fold and by 59.0% respectively in children with irritability problems compared to those who did not report this condition.

Finally, in regard to problems not considered in other screening instruments, the probability of presenting manifestations suggestive of epilepsy is 3.8 times higher in children with irritability, particularly those in the IRN1 and IRN3 categories. In regard to language problems, no significant association was found with irritability in general, although it was found with those who met the IRN1 and IRN2 definitions and younger children.

Discussion

In Mexico and Latin America, as far as we know, there is little research evidence that addresses irritability as a probable syndrome in non-psychiatric children. Here, we present a proposal for the study of irritability using syndrome definitions based on the symptoms explored with the CBTD in Mexican children aged four to twelve.

A previous report which included some of the data in the present study, showed an increase report of symptoms such as irritability and explosiveness across all age-groups, as well as

an increase in almost all CBTD screening syndromes as compared to the 1995 household survey in Mexico City. Surveillance and further study of irritability and explosiveness as core behaviors were considered for further study⁴. This was possible incorporating data from three other studies, one of them in preschool children, which expanded notably the capacity to analyze the phenomenology at an early age including sex distribution, which was not possible in the previous report. By this means, irritability was found consistently associated with explosiveness and isolation, suggesting a defensive attitude in accordance with the accepted definition of irritability as the propensity to express anger and frustration and greater sensitivity to external and internal stimuli⁵.

The only somatic symptom associated with the core definitions of irritability was frequent headaches, and only for IRN1. So, if consultations with doctors are because of somatic symptoms, only a few will attend and most cases of chronic irritability will not be detected if also doctors only pay attention to somatic complains.

Irritability in young children is common, however as shown in this study is a manifestation that should be considered carefully because it's persistence could be associated with several mental health problems and the use of screening instruments as the CBTD can be very useful.

Irritability can be the result of different biological, psychological and social factors. Among the first, neuro-developmental conditions such as Autism spectrum disorders (ASD) have been more frequently seen in child psychiatry as well as Attention Deficit

Hyperactivity disorders. Many of them are brought to attention in school settings and later seen by mental health professionals. However, mental health services are scarce and most problems are presented to paediatricians and general practitioners.

Irritability in children with ASD could show extreme responses to sensorial stimulation such as noises, lights or textures. They usually have difficulties in expressing their needs and emotions, thus frustration and irritability may well be the reaction. Also, they could be very sensitive to strong emotions and conflict. Lack of mental flexibility also facilitates irritability.

Children with ADHD may have problems because of their impulsivity and irritability. Also if they don't find something interesting in their activities, they become frustrated and irritable. If they have also problems regulating emotions, when they find defiant situations, they may become enormously irritated.

The results showed that the syndrome definitions of irritability have been significantly more frequent in the combined base of studies undertaken since 1995. These manifestations are reported from pre-school age and tend to emerge in the most symptomatic, complicated cases according to the CBTD score. The increase of irritability syndromes compared to the 1995 population study may well be the result of the severe financial crisis in Mexico during that year and subsequent consequences affecting the mental health and well-being of future generations¹⁹⁻²².

The syndrome definition in which irritability and explosiveness are core symptoms proved to be the most frequent one, significantly accompanying all CBTD syndromes, whereas

the IRN2 definition, whose core symptoms are irritability and isolation, showed an almost exclusive prevalence with internalization syndromes.

In regard to sex, in girls there were proportionally greater increases for the definitions of irritability that include isolation (IRN1, IRN2), whereas for the nuclear definition of irritability and explosiveness (IRN3), proportionally greater increases were reported in boys. These findings are consistent with the results of a study examining the association between irritability and externalizing and internalizing symptoms and their determination by sex. The study cited found that only in males was there a "stronger" association between irritability and externalizing symptoms, whereas for the female population, irritability was "comparably" associated with both internalizing and externalizing symptoms²³.

The literature describes the role of irritability as a likely marker or predictor of future psychopathological problems^{24,25}. Logistic regression analysis showed that there is a significant association between probable irritability syndrome and depressive conditions regarded as severe in preschool and school children, which frequently go unnoticed in comparison with exteriorizing manifestations that are more conspicuous. Although the relationship between irritability and depression has been widely documented²⁶, it is important to note that since an increase in suicides at an early age has been reported in the Mexican population,²⁷ paying attention to these symptomatic manifestations is relevant for preventive purposes. Continuing with internalizing disorders, the types of anxiety

addressed by the CBTD (both generalized and with inhibition) also showed a significant association with the probable irritability syndromes proposed. Generalized anxiety was strongly associated with the syndrome definition of irritability, whose core component is also explosiveness (IRN3), whereas anxiety with inhibition was primarily associated with the definition that combines the three core symptoms (IRN1), indicating a condition that is less frequent but probably more serious. In short, the findings regarding Mexican schoolchildren and preschoolers appear to confirm what several international research projects have discovered when studying the relationship between childhood irritability and internalizing disorders. For depression, at least, irritability can be considered as a likely marker or predictor, without overlooking the significant theoretical and empirical associations also reported in these studies for anxiety disorders²⁸.

In regard to externalized disorders, known to be common manifestations in childhood²⁹, this study explored the relationship/effect between probable irritability syndrome and the screening ADHD syndromes of the CBTD. Two types, combined and hyperactive-impulsive, show that the presence of irritability increases the likelihood of presenting probable ADHD manifestations in children, confirming what has been reported in the literature, namely that there is a significant rate of concurrence between ADHD and irritability.³⁰ However, the screening hyperactive-impulsive ADHD syndrome was only associated with irritability/explosiveness at early ages, so it may decrease with maturation, unlike the screening combined ADHD syndrome, in

which the association is maintained at later ages. Scientific evidence reports that children with high levels of irritability and ADHD tend to show continuity in problems of externalizing, internalizing, impaired functioning and ADHD itself in adolescence.³¹ Regarding oppositional behavior and its relationship with irritability, there are currently two diagnostic classification systems for its clinical analysis: one regards irritability as a dimension of oppositional disorder and another includes it as a cardinal symptom in a nosological and therefore differentiated definition. Global research that has evaluated the support, usefulness and applicability of the diagnostic categories proposed in the DSM-V and ICD-11 for irritability and defiance provides evidence that the ICD-11 could provide greater accuracy in identifying atypical irritability and, in general, the forms of irritability and their relationship with ODD³². The results of the logistic regression analysis showed that there is a significant association between the syndrome definition of irritability/explosiveness and screening oppositional behavior, predominantly among the boys in our study. These results were expected, given the close relationship between irritability and ODD³³.

Finally, we highlight the association between the syndrome definitions of irritability and probable epilepsy and severe language problems. Both conditions warrant timely detection and treatment in general and pediatric medical consultation.

The main objective of this research has been achieved, since the syndrome definitions presented appear to adequately address the spectrum of symptoms associated with irritability in preschool and school children,

enabling the detection of cases that can be considered clinically significant and most in need of care.

Strengths and limitations of this study

In all the studies included in this research, the same instrument (CBTD) was used. This instrument was originally created with information on the child and adolescent population of Mexico and its performance has been similar to other tools designed to screen for psychopathological problems in children. Data from an important previous population study, conducted with the same diagnostic criteria and evaluation procedure, enable comparisons to be made with the results of the current study and trends to be established. Although the cases that presented irritability as a syndrome were not followed up, except in the study of the health center, it was possible to explore the presence of the criteria in different age groups. It was observed that in all the age groups, from four to twelve years old, irritability was present and comorbid with several probable clinical conditions defined in the CBTD, suggesting chronicity. Information on the children was obtained from what was reported in the questionnaires by the parents or "main caregiver," so there may be some bias in the perception of "problems in children" by the respondent. Since each study that provided data for this report originally had different objectives with different variables, it was not possible to consider other contextual aspects in the analysis that would contribute to explaining the phenomenon. Nevertheless, the results obtained in this research serve as a reference for future

approaches to the phenomenon of irritability, viewed as more than just a non-specific symptom. Finally, the aim was to show the usefulness of the Brief Screening and Diagnosis Questionnaire (CBTD) as a tool for health professionals in both the early detection of probable cases of psychopathology in children, and as the basis for the development of methodological proposals for the study and surveillance of mental health in children at primary care.

Conclusion

Evaluation of the presence of chronic irritability along with explosiveness and isolation in preschool and school age children is highly recommended because they could indicate the presence of different mental health issues that otherwise would be undetected.

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