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Original article

PREVALENCE AND RISK FACTORS OF ANXIETY IN CHILDREN IN NORTH MACEDONIA

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Abstract

Anxiety disorders are considered the most prevalent and pervasive mental health problems in children globally. The development of preventive strategies requires information on prevalence rates and identification of risk factors. However, such data is not available for North Macedonia. The current study aims to fill the research gaps by estimating prevalence rates, and applying the ecological risk model in examining risk factors of anxiety in preschool and school-aged children in North Macedonia.

Data was taken from a pre-post study testing the effectiveness of a parenting program in young children in North Macedonia. A total of 288 parents of children aged 2-9 years were included. Cutoff scores were used to estimate prevalence rates, and generalized linear models were used to analyze baseline data on the influence of individual, family and social risk factors on childhood anxiety.

Data showed that more than 6% of preschool-aged children, and more than 11% of school-aged children were affected by clinically significant levels of anxiety. The study also showed that dysfunctional parenting practices were a strong predictor of anxiety in preschool-aged children, while parental depression and anxiety were the strongest predictors in school-aged children.

The current study offered first insights into prevalence rates, and highlighted the existence of unique contributions of family-related risk factors that affect different presentations of anxiety in young children in North Macedonia. The findings may contribute to an improved understanding of the complex processes involved in the development of anxiety, and may offer directions for evidence-based interventions.

Keywords: anxiety, children, prevalence, risk factors, North Macedonia

Introduction

Anxiety disorders are considered the most prevalent and pervasive mental health problems in children globally[1]. Adjusted prevalence rates indicate that between 5.3-10.4% of children experience clinically significant levels of anxiety worldwide[2], yet recent estimates point to an increase in this population during the COVID-19 pandemic[3]. Anxiety represents a major factor of the internalizing cluster of mental health problems in children[4]. Clinical levels of anxiety appear early in development, as early as in pre-school aged children[5]. They are considered more prevalent than externalizing problems[6], where the rates of anxiety tend to increase with age[7], and have a serious negative impact on later

academic, professional, family, and social functioning[8]. Anxiety has also shown to be a predictor of the later development of other mental health problems[9].

The development of preventative strategies with regard to childhood anxiety requires information on prevalence rates and the identification of risk factors for anxiety[10]. The ecological risk model indicates that multiple predictors may play a role in the development of anxiety, emerging from the individual, family and social systems of influence[11,12]. For example, being female has been shown to be a risk factor for anxiety in children. A meta-analytic review conducted by Chaplin and Aldao[13] found that girls expressed internalizing emotions significantly more than boys, yet there is unclear evidence regarding the existence of gender differences before adolescence[14]. Parental mental health may also play a role in their children's mental health[15]. A study conducted by Burstein, Ginsburg and Tein[16] showed that the presence of parental anxiety increased the likelihood of internalizing symptoms in their children. Moreover, the available literature accents the quality of family interactions as an important factor in the development of internalizing symptoms in children[17,18]. For example, a meta-analysis conducted by McLeod, Wood and Weisz[19] demonstrated that dysfunctional parenting styles were associated with childhood anxiety. In addition, a meta-analysis conducted by Vu *et al.*[20] found that exposure to intimate partner violence increasingly contributed to child internalizing symptoms with age. Regarding the influence of social factors, Slopen *et al.*[21] assessed a large community-based sample of children and showed that internalizing problems were more likely in children from families of low socioeconomic status. However, most studies in children are conducted in high income countries[22], and few investigate anxiety in pre-school and school-aged children[8]. Data on the prevalence and risk factors of anxiety in children is currently not available in North Macedonia.

In order to fill the research gaps and contribute to a more integrated understanding of childhood anxiety, this study aimed to examine 1) prevalence rates, and 2) risk factors contributing to anxiety in pre-school and school-aged children in North Macedonia. It is expected prevalence rates to be higher compared to data from high income countries, and family-level risk factors to have a strong influence on anxiety in children.

Materials and methods

Participants and procedure

A controlled pre-post study was conducted examining a parenting intervention for parents of children aged 2-9 years old in North Macedonia. Parents were recruited through kindergartens, primary schools, leaflets, social media advertisements, and community referrals. Parents included in the study were at least 18 years old and lived in the same household as the target child. All subjects provided oral and written consent to participate in the study. For the current study, data was analyzed from the collected baseline assessments, which consisted of self-report questionnaires on sociodemographic characteristics, child and parental mental health, parental conflict, as well as parenting practices.

Outcome measures

Sociodemographic characteristics

Parents were asked to share demographic and socioeconomic characteristics, including parent and child age and gender, number of children and adults living in the household, level of completed education, marital status, and employment status.

Childhood anxiety

In order to assess childhood anxiety, three subscales of the Child Behavior Checklist (CBCL)[23,24] were evaluated: the CBCL anxiety problems scale (CBCL-AP)[25] and the

CBCL anxiety scale (CBCL-A)[26] for children aged 6-9, and the CBCL anxiety/depression scale (CBCL-AD)[23,24] for children aged both 2-5 and 6-9. All CBCL subscales represent parent-rated scales with response options given on a 3-point range (0= not true, 1= somewhat or sometimes true, 2= very true or often true), where higher scores indicate higher severity of problems. CBCL-AP is a 6-item scale that represents anxiety-specific problems in school-aged children, including symptoms of separation anxiety disorder, generalized anxiety disorder, and specific phobia. CBCL-A is a 16-item scale that includes the 6 items of the previous scale and has additional 10 items covering functional somatic symptoms. CBCL-AD is a 13-item scale related to anxiety with depressive symptoms. The aforementioned scales have shown to discriminate between children with and without anxiety[27-29]. The internal consistencies for the present sample for CBCL-AP was 0.50 (Cronbach's alpha), for CBCL-A was 0.69, and for CBCL-AD was 0.64 for children aged 2-5 and 0.69 for children aged 6-9. The internal consistency of the CBCL-AP scale was low, and no improvements were shown when discarding items. Therefore, this scale was not included in the analysis.

Parent mental health

Symptoms of anxiety and depression in parents were assessed using the Depression, Anxiety and Stress Scale (DASS-21)[30]. DASS-21 is a 21-item self-report questionnaire, with response options on a 4-point Likert scale ranging from "0= Never" to "3= Almost always". The scale contains three 7-item subscales for anxiety, depression and stress, with scores ranging from 0 to 42. Higher scores indicate higher severity of symptoms with available cut-off scores as well. The internal consistency of both the anxiety and depression subscales was 0.81 for the present sample.

Parental conflict

Parental conflict was measured using the O'Leary Porter Scale (OPS)[31]. The OPS is a 10-item self-report questionnaire assessing overt hostility in couples with children. The measure assesses the intensity of disagreements (e.g., discipline, personal habits), affection, as well as physical and verbal aggression. Parents rate the frequency of conflict on a 6-point Likert scale, ranging from "Never" to "Very often", where higher scores indicate higher levels of overt hostility. The internal consistency of the scale for the present sample was 0.82.

Dysfunctional parenting

Dysfunctional parenting practices were measured using the Parenting Scale (PS)[32]. The PS is a 30-item questionnaire assessing parenting and discipline behaviors on a 7-item Likert scale, where higher scores indicate a higher level of dysfunctional parenting. The measure incorporates three factors, including laxness (e.g., giving in, not enforcing rules), overreactivity (e.g., anger, irritability), and verbosity (e.g., ineffective lengthy talking) in the parent-child relationship. The internal consistency of the PS was 0.78 for the present sample.

Data analyses

Data analyses were conducted with the computer software SPSS version 24[33]. Sociodemographic characteristics and prevalence rates at baseline are reported as means (*M*) and standard deviations (*SD*) for continuous variables, as well as counts (*N*) and percentages (%) for categorical variables. Multiple imputation to impute missing data was not used in the current study. Group differences in sociodemographic data were tested using ANOVA and chi-squared tests. Analyses were conducted on an aggregate level, as well as comparatively for specific subcategories. For exploring risk factors, associations between the dependent variable (childhood anxiety) and independent variables (risk factors) were tested using generalized linear models. The study examined the influence of individual (child gender and

age), family (marital status, number of children and adults living in the household, parental mental health, parental conflict, dysfunctional parenting), and social (level of completed education, employment status) risk factors in relation to childhood anxiety. Results of direct effects are reported as regression coefficients (B), standard errors (SE) and 95% confidence intervals (CI). The significance level for all analyses was set at $p<0.05$.

Results

Table 1 shows the sociodemographic characteristics of the sample. A total of 288 parents participated in the study. The majority of participants were women (95.1%) with an average age of 36.9 years (SD= 4.8). Majority of them were married and living together with their partner (85.1%), had university degree (72.2%), and were employed (88.2%). The target children were mostly boys (59%), with an average age of 5.4 years (SD= 2.2).

Table 1. Sociodemographic characteristics of the sample

	N (%)	***M (SD)***
Age		
Parent		36.9 (4.8)
Child		5.4 (2.2)
Parent gender		
Female	274 (95.1)	
Male	14 (4.9)	
Child gender		
Female	118 (41.0)	
Male	170 (59.0)	
Household size		
Adults		2.4 (0.9)
Children		1.6 (0.7)
Marital status		
Single	9 (3.1)	
In a relationship and living together	9 (3.1)	
In a relationship and not living together	1 (0.3)	
Married and living together	245 (85.1)	
Married and not living together	1 (0.3)	
Separated or divorced	19 (6.6)	
Widowed	4 (1.4)	
Highest level of education		
Completed elementary school	2 (0.7)	
Completed high school	10 (3.5)	
Some vocational school	1 (0.3)	
Completed vocational school	33 (11.5)	
Some university	2 (0.7)	
Completed university	208 (72.2)	
Other	32 (11.1)	
Formal job		
Yes	254 (88.2)	
No	34 (11.8)	

Table 2 shows the prevalence rates of anxiety problems in children. Parents reported clinically significant levels of anxiety with symptoms of depression in 6.5% of children aged 2-5 years, and in 11.1% of children aged 6-9 years. Clinically significant levels of anxiety with functional somatic symptoms were reported in 8.1% of children aged 6-9 years. The average scores of anxiety problems in the sample were in the non-clinical range of symptoms.

Table 2. Prevalence of anxiety problems in children by age group and outcome measure

	2-5		6-9	
	N (%)	**M (SD)**	**N (%)**	**M (SD)**
Severity				
CBCL-AD		50.4 (10.6)		54.4 (10.8)
CBCL-A				4.6 (3.4)
Incidence				
CBCL-AD	10 (6.5)		15 (11.1)	
CBCL-A			11 (8.1)	

Note. CBCL-AD, Child Behavior Checklist – Anxiety/Depression; CBCL-A, Child Behavior Checklist – Anxiety

Table 3 shows the effects of risk factors on anxiety in children. The results show that the full models significantly predict anxiety in children aged 2-5 years (Omnibus x2= 37.62, df= 17, p= 0.003), and anxiety with depressive symptoms in children aged 6-9 years (Omnibus x2= 47.15, df= 17, p= 0.000). However, the full model did marginally, but not significantly, predict anxiety with functional somatic symptoms in children aged 6-9 years (Omnibus x2= 26.54, df= 17, p= 0.065). The parameter estimates of the direct effects indicated that only dysfunctional parenting practices (B= 2.55, p= 0.017), as a family risk factor, showed significant effects on anxiety in children aged 2-5 years. On the other hand, parental depression (B= 0.67, p= 0.001), also a family risk factor, had significant effects on anxiety with depressive symptoms in children aged 6-9 years, while parental anxiety (B= 0.12, p= 0.044) had significant effects on anxiety with functional somatic symptoms in children aged 6-9 years.

Table 3. Effects of risk factors on anxiety in children by age group and outcome measure

	2-5		***6-9***			
	CBCL-AD		***CBCL-AD***		***CBCL-A***	
	B	***SE***	***B***	***SE***	***B***	***SE***
Individual risk factors						
Child age	1.45	0.811	1.67	0.88	0.26	0.24
Child gender (female)	0.72	1.68	2.95	1.88	0.31	0.51
Family risk factors						
Household size						
Adults	-0.85	1.03	3.56	3.56	-0.48	0.36
Children	0.43	1.28	3.56	3.56	.079	0.35
Parent age	-0.14	0.189	0.15	0.21	0.08	0.06
Parent gender (female)	-3.31	4.88	-3.62	3.85	-1.21	1.05
Marital status	5.34	5.11	2.05	4.11	1.39	1.12
Parental depression	0.21	0.27	0.67**	0.20	0.04	0.05
Parental anxiety	0.17	0.19	0.32	0.22	0.12*	0.06
Dysfunctional parenting	2.55*	1.07	-1.52	1.20	0.01	0.33
Parental conflict	0.31	0.18	-0.16	0.18	-0.08	0.05
Social risk factors						
Level of education						
Completed elementary school	2.02	7.29				
Completed high school	2.82	5.76	-2.79	5.87	0.63	1.59
Some vocational school			-3.89	10.99	-0.99	2.99
Completed vocational school	2.91	3.44	-2.46	4.14	1.51	1.13
Some university	-0.80	11.44	-3.74	10.33	1.39	2.81
Completed university	-1.76	2.64	-5.53	3.08	-0.42	0.84
Employment status	5.06	5.76	4.97	4.54	1.81	1.24

Note. CBCL-AD, Child Behavior Checklist – Anxiety/Depression; CBCL-A, Child Behavior Checklist – Anxiety; *p<0.05, **p<0.001

Discussion

The current study aimed at estimating the prevalence rates of childhood anxiety, and used the ecological risk model to examine the influence of individual, family and social risk factors of anxiety in preschool and school-aged children in North Macedonia. The study offered first findings in prevalence rates of anxiety in young children in the country. The presented models also provided evidence of the importance of family-related risk factors that affected the different presentations of anxiety in young children in North Macedonia.

Considering previous research, it was hypothesized that the prevalence rates of anxiety in young children would be higher compared to data available from high-income countries. The assumption was supported by the findings of the current study by showing that more than 6% of preschool-aged children, and more than 11% of school-aged children in the country were affected by clinical levels of anxiety. A study conducted by Ford *et al.* [34], using parent and teacher reports of a large sample of children aged 5-10 years in the United Kingdom, showed that up to 3.19% of children had an anxiety disorder. However, a comprehensive literature review, conducted by Cartwright-Hatton, McNicol and Doubleday[35], indicates that there are vast differences in the reported prevalence rates of anxiety in high-income countries. These may depend on several study design factors, including diagnostic criteria, assessment strategies, employment of clinicians, and selected informants, which future studies need to take into account.

The second hypothesis, pointing to the strong influence of family risk factors on childhood anxiety, was also supported by the presented risk models. The findings showed that dysfunctional parenting practices and parental psychopathology were the strongest predictors of anxiety in children. Similar studies conducted in North Macedonia have shown that violent discipline practices are highly prevalent in the country[36], which are shown to be associated with negative mental health effects in adolescents during the COVID-19 pandemic[37]. However, the current study did not demonstrate the existence of significant effects of individual child factors and social factors. Available data points to a high likelihood of exposure to violence, family conflict, socioeconomic disadvantages, and insufficient mental healthcare capacities in the country, which in turn could contribute to a higher risk for mental health problems in children[38]. It remains to be explored whether these factors are dependent on the studied sample, or become markedly relevant in relation to anxiety later in development[39].

The results are also consistent with the available literature indicating that children of parents with anxiety and depression are at a higher risk of developing anxiety themselves[40]. A possible explanation for this relationship is that children likely model the negative affectivity of their parents, and may also be exposed to an unfavorable family climate, characterized by low levels of warmth and ineffective parenting approaches[41]. Such a family climate may increase the vulnerability of children, disturb their emotional security, and reinforce maladaptive coping strategies. These factors are believed to contribute to avoidance behaviors, longstanding inhibition, and the development of anxiety with negative effects throughout the lifespan[42].

However, the findings should be interpreted with some limitations. Most data were collected from a single parent, predominantly the mother, with a limited inclusion of fathers. A large majority of parents were also of high socioeconomic status, who were interested in a parenting program, which may not reflect the ecological factors experienced by other families or by families of lower socioeconomic status. Future research could incorporate other potential predictors as well, which could improve the risk models of childhood anxiety. These could include peer and teacher relationships, interactions with other family members, temperamental and biological factors, as well as the exploration of their moderating and mediating effects on anxiety[43].

The current study provides a valuable description of the prevalence of different presentations of anxiety in early childhood. Its findings may contribute to an improved understanding of the complex processes involved in the relationship between childhood psychopathology and their environment in the early years of development. From a policy perspective, the results may offer support for the importance of mental health screening for young children and parents. In addition, learning more about the influence of risk factors may contribute to the development and evaluation of evidence-based early intervention and prevention strategies for young children.

Conclusion

The current study investigated prevalence rates and risk factors of anxiety in young children in North Macedonia. The findings showed that different presentations of anxiety were found in 6.5% - 11.1% of young children in North Macedonia. Anxiety with symptoms of depression was the most prevalent presentation of anxiety, where school-aged children were more affected compared to preschool-aged children. The study also highlighted the existence of unique contributions of family-related risk factors. Specifically, these include exposure to dysfunctional parenting practices and parental anxiety and depression, as strong predictors of anxiety in young children in North Macedonia. Additional research is needed to examine the influence of other contextual, biological and temperamental factors, their moderating and mediating effects, and incorporate high quality study designs in order to further explore the mechanisms involved in anxiety in young children.

Conflict of interest statement. None declared.

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