

Does talent protect or compromise? Investigation of the emotional and behavioural disorders and giftedness in children

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Abstract

Gifted children are often portrayed in a positive light, with little attention given to the potential emotional and behavioural challenges they may face. The aim of this study was to examine the predictive role of parental and child-related socio-demographic factors, as well as giftedness factors (learning, motivation, creativity and leadership), on aspects of emotional and behavioural disorders. A total of 182 parents completed the demographic questionnaire, the Renzulli-Hartman Scale and the CBCL questionnaire. Our results indicated that, in addition to giftedness, the parental age, the fathers' education level and chronic illnesses are significant predictors of emotional and behavioural disorders. Giftedness had a greater predictive power for internalization symptoms than for externalization symptoms, in line with previous studies.

Keywords: emotional and behavioural disorders; giftedness; learning; predictive factors

1. Introduction

1.1. Defining giftedness

Even though the concept of giftedness has been explored by numerous theorists, researchers, and practitioners over time, no general definition has emerged that includes standard criteria for exceptional talent, remarkable gifts, and outstanding ability (Daniels & McCollin, 2010). Early definitions and views of giftedness relied solely on high intelligence as the criterion, placing a unique emphasis on intelligence tests to identify giftedness (Ogurlu, 2020).

From a rather conservatory approach, Lewis Terman defined giftedness as the top 1% level of general intellectual ability (Terman, 1926, cited by Renzulli, 2011). According to Paul Witty (1958), gifted children are those whose outstanding potentialities in art, writing, or social leadership can be recognised largely by their achievement. The author recommended extending the definition of giftedness to include any child whose performance in any potentially valuable field of human activity is consistently remarkable (Witty, 1958). Renzulli (2011) highlights the challenge of defining giftedness and identifying gifted children based on common

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criteria, justifying that a too specific definition may limit or restrict the areas of achievement considered for special programmes. Early definitions tended to associate giftedness with intelligence and creativity.

In the contemporary society, giftedness is considered a social construct that is not influenced by environmental factors. This ability is observed across all ethnicities and socio-economic statuses, and in both genders. Giftedness is a term commonly used to describe the ability to produce novelty or an exceptionally high level of ability in one or more domains. Borland (2009), Gowan (1971), and Dai (2018) have also defined giftedness in similar ways.

According to the more recent literature, giftedness is an interaction between above-average general abilities, high levels of creativity, and high levels of task performance (Renzulli, 2011; Pfeiffer & Yarnell, 2016). In line with this, an individual with exceptional abilities demonstrates outstanding performance in one or more specific areas that span different disciplines, such as mathematics, science, or technology, or cross-cutting skills like communication, leadership, or planning. Furthermore, they demonstrate high levels of task commitment, which is the motivation that propels individuals to successfully complete a given task, and creativity, which is the expression of original and inventive ideas (Taska et al., 2022).

1.2. Emotional and behavioural disorders and giftedness

The term 'emotional and behavioural disturbance' (EBD) has been in use since 1980, being coined by the National Mental Health and Special Education Coalition Group (Kauffland & Landrum, 2013). According to the requirements of the Individuals with Disabilities Education Improvement Act (IDEA, 2004), emotional and behavioural disorders (EBD) is defined as a condition that exhibits one or more of the following characteristics over a long period of time and to a significant degree that adversely affects a child's educational performance: (A) An inability to learn that cannot be explained by intellectual, sensory, or health factors. (B) Difficulty in establishing or maintaining satisfactory interpersonal relationships with peers and teachers. (C) Inappropriate behaviour or feelings in normal circumstances. (D) A general and pervasive mood of unhappiness or depression. (E) A tendency to develop physical symptoms or anxieties related to personal or school problems. (ii) Schizophrenia is included as a form of emotional disturbance.

Behavioural and emotional disorders are mental health problems (MHP) that affect children and young people. These disorders include behavioural disabilities, such as: oppositional defiant disorder and conduct disorder, and emotional disorders, this category encompasses a wide range of conditions, e.g. depression, anxiety disorders, obsessive compulsive disorders, disruptive mood dysregulation disorder (DMDD), and other mood disorders. Defining the concept of disruptive behaviour or conduct disorder can be challenging due to its socio-cultural dependence.

The relationship between giftedness and neuropsychiatric disorders has been investigated in several studies (Eren et al., 2018; Taska et al., 2022; Guénoilé et al., 2013). However, the literature debates the relationship between emotional and behavioural disorders and giftedness (Williams et al., 2023). Some studies suggest that giftedness is a protective factor for mental health (Eklund, 2015), while others report contradictory results (Blaas, 2014; Karpinski et al., 2018).

Several studies have shown associations between creativity and behavioural problems, particularly aggressive behaviour (Cropley et al., 2008; Gino & Ariely, 2012; Lüdeke et al., 2022; Petrou et al., 2018). In the academic literature, the term 'twice-exceptional' is used to describe students with a neuropsychiatric disorder who exhibit giftedness in one or more domains (Foley et al., 2011). The most frequent comorbidities associated with giftedness are attention-deficit/hyperactivity disorder (ADHD), autism spectrum disorder (ASD), and learning disabilities (Assouline et al., 2000; Foley et al., 2011).

The constructs of internalisation (INT) and externalisation (EXT) are frequently used to describe emotional and behavioural disorders (Nikstat & Riemann, 2020).

Internalising symptoms refer to emotional experiences that are more challenging for the child than for those around them (Gádoros, 1996). Gifted students commonly experience internalised disorders such as anxiety, low self-esteem, and excessive perfectionism (Guignard et al., 2012; Kermarrec et al., 2020; Peperkorn et al., 2020; Mofield et al., 2015). Kermarrec et al. (2020) discovered a positive correlation between intelligence level and anxiety disorders. This means that individuals with an intelligence level above the value of 130 are more likely to experience generalised anxiety symptoms, phobic anxiety disorder, and separation anxiety disorder.

In the scientific investigation of giftedness, it is important to consider the characteristics of peer problems, anxiety, and depression in gifted children. Regarding peer problems, gifted children are often identified by their advanced language skills, extensive vocabulary, clear pronunciation, flexible communication, abstract thinking, personal philosophy, and exploration of identity. These characteristics may be difficult for their peers to comprehend (Robinson, 2007; Altman, 1983). Gifted children may experience internalisation difficulties, such as boredom, as they may feel that they are wasting their time learning things they have already mastered earlier than their peers (Dai, 2013; David, 2018).

Studies have reported that gifted children perceive their giftedness positively in terms of their own development and achievements. However, from the perspective of their peers, their high achievement and intellectual level can be perceived as negative and disadvantageous, as it may put them at risk of rejection in the school environment (Cross, 2007; Robinson, 2008). Moreover, when analysing the symptoms of anxiety and depression in gifted children, it becomes apparent that parents and teachers often have unrealistically high expectations. Due to their inability to accept failure, these children can become highly anxious under pressure, develop a fear of failure, and feel intensely challenged to learn from their mistakes, leading to perfectionism (Dai, 2013; Pfeiffer et al., 2016).

Maladaptive coping mechanisms, overwhelming feelings of hopelessness, helplessness, and worthlessness perpetuate and accentuate the gap in self-esteem when compared to peers. Therefore, self-image can be problematic when individuals fail to meet the high expectations of the significant adults in their social networks. As a final option, individuals may withdraw and become isolated, which can lead to feelings of loneliness and depression, or even more severe symptoms such as suicidal thoughts and attempts in advanced stages of depression (Winsor & Mueller, 2020).

When communicating with children included in the category of gifted individuals, it is important to avoid subjective evaluations and use clear, objective language with precise word choice. The content of the discourse, including the written texts, should adhere to conventional structure and formatting features, with a formal register and balanced tone. The structure should have a logical progression with causal connections between statements. Grammatical correctness is essential, and changes in content must be avoided.

There have been few studies on gifted students with externalising problems (Peyre et al., 2016; Shaywitz et al., 2001; Eren et al., 2018). Externalising symptoms are characterised by behavioural disturbances, including disruptive behaviour in the environment, deviant behaviour, and aggression in gifted children. It is commonly believed that gifted children are perceived by their peers as exhibiting low levels of aggression but also disruptive behaviour, as opposed to those who are classified as undiscovered talents (Cohen et al., 1994; Farmer & Hollowell, 1994; Pearl et al., 1998). Estell et al. (2008) present a nuanced perspective on how teachers perceive gifted pupils as the least abusive and violent population.

When it comes to the manifestation of aggression towards peers, gifted children exhibit similar symptoms of aggression to average children (Peairs et al., 2019). Gifted children are often described as having attention difficulties and externalizing problems, such as delinquent and aggressive behaviour (Eren et al., 2018; Tasca et al., 2022). They may also struggle with social skills and have difficulty fitting into groups, which can lead to rejection (Kewalramani & Singh, 2017). Likhanov et al. (2020) indicate that exceptional children experience more internalisation and externalisation problems than their peers. Additionally, they score significantly higher

than children with normal achievement in areas such as depression, attention/hyperactivity, peer problems, and physical health (Eren et al., 2018).

Mundy et al. (2017) found that children with conduct problems, hyperactivity / attention problems, emotional problems, peer problems, and problematic prosocial behaviour achieve lower scores in maths and English. Eklund et al. (2015) concluded that gifted children are not perceived as being at risk for emotional and behavioural problems by parents and teachers, but they are more likely to have internalising symptoms than their peers.

1.3. Socio-demographic factors associated with EBD and giftedness in children

Among the socio-demographic characteristics that may influence the relationship between EBD and giftedness, gender is an important factor. Questions remain in the literature regarding the gender distribution of EBD / conduct disorder prevalence and manifestation (Berkout et al., 2011). Previous research indicates that conduct disorder is more prevalent in boys than in girls (APA, 2013). In girls, aggressive behaviour and conduct disorder may manifest as internalising symptoms and may be more prevalent in close relationships (Brooks et al., 2017).

Another important socio-demographic characteristic is the age. Hence, children with early-onset conduct disorder are at a higher risk of persistent difficulties than those who develop conduct disorder in adolescence (Patel et al., 2018). Additionally, several studies have shown that chronic illness is a strong predictor of emotional and behavioural problems, particularly internalizing problems such as anxiety and depression (Lacomba-Trejo et al., 2020).

Among the socio-demographic characteristics, family characteristics are also prominent, several studies in the literature have emphasised the role of the family in the development of conduct disorder. However, most studies have focused on parenting style and have overlooked the influence of siblings and parental demographics (Hosokawa et al., 2018; Hayek et al., 2021; Freeze et al., 2021). The literature suggests that parental demographics, such as parental education, can have an impact on children's learning activities.

Research has shown that parents with a secondary education have a positive impact on their children's literacy (Baroody & Dobbs-Oates, 2011). Additionally, parental education is correlated with their children's academic achievement (Cui et al., 2019). Erdener & Knoepfel (2018) found that educated parents are actively involved in their children's schooling decisions, taking into account their academic and career plans. Cui et al. (2019) found that maternal education has a significant positive effect on adolescents' school enrolment, academic aspirations, and mathematics test scores, while also promoting their internal control over their education.

2. Methodology

2.1. Objective

As the results of previous studies on the relationship between giftedness and EBD in children have been rather inconsistent, the present study was designed to clarify this relationship. The major objective of the present study is to examine the predictive power of socio-demographic characteristics and giftedness on emotional and behavioural disorders in children. Additionally, the study aims to explore how these factors play a role in internalizing and externalizing symptoms, which are the two main categories of symptoms that come under the umbrella term of the “emotional and behavioural disorders”.

2.2. Participants

The study sample comprised of 182 parents from Romania, aged between 27 and 55 years, with a mean age of 41.44 years (SD = 4.79). The age of their children

ranged from 4 to 18 years ($M= 11.13$; $SD= 2.62$). Table 1 presents the descriptive statistics on the sample characteristics, for both the parents and the children.

Table 1. Descriptive statistics on the characteristics of the sample

Participant characteristics	N (%)
Parent who completed the questionnaire	Mother = 171 (94%) Father = 11 (6%) 27-55; N= 182
Parental Age, Range ($M \pm SD$)	($M= 41.44 \pm SD=4.79$)
Parental level of education	Fathers' educational level Elementary school = 5 (2.7%) High school without Baccalaureate exam = 43 (23.6%) High school with Baccalaureate exam = 56 (30.8%) Higher education = 72 (39.6%) Other type of education = 6 (3.3%) Mother's educational level Elementary school = 1 (0.5%) High school without Baccalaureate exam = 13 (7.1%) High school with Baccalaureate exam = 37 (20.3%) Higher education = 122 (67.0%) Other type of education = 9 (4.9%)
Children's biological sex	Male = 94 (51.6 %) Female = 88 (48.4 %)
Chronic illness of children	Yes = 9 (4.9%) No= 173 (95.1%)
Children Age, Range ($M \pm SD$)	4-18; N= 182 ($M= 11.13$; $SD \pm 2.62$)
Other children in family	Yes = 129 (70.9%) No =53 (29.1%)
Number of siblings	1 = 85 (46.7%) 2 = 31 (17.0%) 3 = 11 (6%) 4 = 2 (1.1%)
Academical performance of children	67 = Very high performance (36.8) 84 = High performance (46.2) 29 = Moderate performance (15.9) 2 = Low performance (1.1)

2.3. Instrument

Socio-demographics information

The questionnaire package commences with details about the study, followed by socio-demographic questions. These included the parental age and gender, the respondent's level of education, the other parent's level of education, the number of siblings, the child's biological sex, age, school performance, academical performance of children, and their chronic illness, if any.

Giftedness (SRBCSS; Renzulli, Hartman, & Callahan, 1971)

The parental version of the Scale for Rating Behavioural Characteristics of Superior Students (SRBCSS; Renzulli, Hartman, & Callahan, 1971) was used to identify potentially gifted students. The Renzulli-Hartman scale measures specific characteristics along behavioural scales to identify and select gifted students. The scale comprises 35 items divided into four subscales that assess Learning Characteristics (T), Motivational Characteristics (M), Creativity Characteristics (K), and Leadership Characteristics (V). The Learning Characteristics subscale includes 7 statements, the Motivational Characteristics subscale includes 9 statements, the Creativity Characteristics subscale includes 9 statements, and the Leadership Characteristics subscale includes 10 statements.

For each student, complete the scale separately by marking an X in the corresponding box. The boxes correspond to the following scale values: rank 1 if the characteristic was never or very rarely observed, rank 2 if the characteristic was occasionally observed, rank 3 if the characteristic was quite often observed, and rank 4 if the characteristic was almost always observed (Ormai et al., 1987, pp. 180-182).

Once the scale has been completed, it is scored by taking the weighting value (1-2-3-4) from each column as many times as the number of Xs collected by the student. The total is then entered in the Total box. The average is calculated by dividing the value entered in the Total box by the number of statements in that section. This process allows for the construction of an individual profile based on the main areas (Kósáné Ormai et al., 1987, pp. 180-182). In this study, the scale demonstrated excellent internal consistency ($\alpha = .89$). Table 2 displays the internal consistencies for the subscales.

2.4. Emotional and Behavioural Disorders (CBCL; Achenbach, 1991; Rózsa et al., 1999)

The Child Behavioural Check List - parental version (Achenbach, 1991; Rózsa et al., 1999) was used to assess emotional and behavioural disturbances. This checklist is part of the Achenbach System of Empirically Based Assessment (ASEBA) and consists of 46 questions scored on a three-point Likert scale (0=not present, 1=occurs sometimes, 2=occurs often). The parent, teacher, and self-report versions of the questionnaire were then standardized and measured on a large national sample (Rózsa et al., 1999).

This scale measures two broad dimensions: the internalisation domain, which includes social relationship problems (such as difficulties with peers and adults), mood and emotional problems (such as anxiety and mood signals), and somatic symptoms (such as physical complaints); and the externalization domain, which includes attention (such as hypermotility and distracted/impulsive attention), deviant behaviour (such as violation of norms), and aggressiveness (such as temperament and destructiveness). The total scale demonstrated very good internal consistency in this study ($\alpha = .90$), with the internal subscale at $\alpha = .85$ and the external subscale at $\alpha = .87$.

2.5. Procedure

The study employed a correlational non-experimental research design to investigate the link between emotional and behavioural disorders and giftedness, including learning, motivation, creativity, and leadership. Data was collected online through the Google Forms platform from December 2021 to February 2022. Sampling was conducted through convenience self-selection using the 'chain' or 'snowball' method (Clark-Carter, 2010) and social media platforms. Participants were invited to take part in an online study on emotional and behavioural disorders and giftedness in children in Romania via electronic message with a link to the study.

Participants were given the opportunity to decide whether or not to take part in the study after reading a concise description of the study's nature, as well as the security and anonymity measures that the authors had committed to providing for the data and information provided by the participants. Informed consent was obtained through the parents' decision to continue their child's participation in the study after reviewing this information. By clicking on the button to opt out of the study, participants were automatically directed to the study's exit page.

The estimated completion time for the questionnaires was a maximum of 20 minutes, with the option for participants to interrupt the process. Parents were given an email address specifically for this study. They can use it to contact the study authors if they have any questions or need clarification.

2.6. Data analysis

A cross-sectional correlational design was employed. The analysis was conducted using SPSS (Statistical Package for the Social Sciences) version 25.0. Missing data were excluded from the analysis. Normal distribution was not assessed, as linear regression analysis only requires residuals to be normally distributed, not the variables themselves. The internal consistency of the scales and subscales was evaluated by calculating Cronbach alpha values. Table 2 presents descriptive statistics, including percentages for categorical variables and mean and standard deviation for continuous variables.

To investigate the predictors of emotional and behavioural outcomes, we used hierarchical multiple regression models and introduced categorical variables as dummy variables. Linearity, homoscedasticity, and multicollinearity were tested. The Durbin-Watson statistic was used to test for autocorrelation in the residuals. The residuals of the regression line are approximately normally distributed, as shown in the Normal P-P plot. All data are presented as the mean (M) and standard deviation (SD) for continuous variables and as frequencies/percentages for categorical variables. A p-value less than 0.05 was considered statistically significant.

Table 2. Descriptive statistics of the instruments and subscales, reliability indicators

	Mean	Std.	Median	Min.	Max.	α
SRBCSS_total	108,08	1,03	109,00	55	140	,89
SRBCSS_learning	22,68	,28	23,00	9	28	,83
SRBCSS_Motivation	26,10	,33	26,00	11	36	,72
SRBCSS_Creativity	27,69	,29	28,00	17	36	,66
SRBCSS_Leadership	31,60	,36	32,50	12	40	,80
CBCL_Total	12,23	,72	10,00	0	50	,90
CBCL_intern	6,26	,41	5	0	25	,85
CBCL_extern	5,96	,41	4,5	0	30	,87

2.7. Power and sample size

A priori power analysis was performed using G*Power software for hierarchical linear regression (total number of predictors 11, number of tested predictors 4) with a

p-value of 0.05 and statistical power of 0.95. Results showed that for a medium effect size ($f^2 = 0.15$) the required sample size is $n = 129$, while for a small effect size ($f^2 = 0.02$) the required sample size is $n = 934$ and for a large effect size ($f^2 = 0.35$) the required sample size is $n = 59$. The sample size of the study ($N = 182$) proved to be suitable for detecting medium effect sizes.

3. Results

3.1. Results for CBCL total

This study used a three-stage hierarchical regression model to examine the predictor variables of the symptoms of the conduct disorder. In the model 1, it was introduced socio-demographic variables of the children, including age, biological sex, chronic illnesses, and number of siblings, as control variables. The hierarchical model included the children's gender and chronic illnesses as dummy variables.

The results indicate that children's age, biological sex, number of siblings, and chronic illnesses are significant predictors of conduct disorder. These factors independently account for a significant 5.7% of the variance in emotional and behavioural disorders. ($\Delta R^2 = .03$, $F_{\text{change}}(4,177) = 2.65$; $p < .05$).

The parental socio-demographic factors were added in the Model 2. The results show that after the addition of the variables parental age and educational level, 11.6% of the total variance was explained ($\Delta R^2 = .08$, $F_{\text{change}}(3,17) = 3.92$; $p < .05$). Parental age and educational level added a further significant 5.9% of the variance.

The giftedness factors in Model 3 significantly added a further 26.8% to the predictive power of the model ($\Delta R^2 = .34$, $F_{\text{change}}(4,17) = 18.45$; $p < .01$). The total predictive power of the model is 38.4% of the variance.

Table 3. Hierarchical regression results for CBCL

Variable	Model 1			Model 2			Model 3		
	B	SE B	β	B	SE B	β	B	SE B	β
(Constant)	9.28**	3.28		4.84	6.92		26.57**	7.15	
Biological sex of child (male)	2.92*	1.43	.15	3.14*	1.40	.16	2.55*	1.22	-.90
Age of child	.02	.27	.00	-.34	.31	-.09	-.33	.27	-.09
Number of siblings	.73	.80	.06	1.16	.79	.10	1.18	.67	.10
Chronic illnesses (Yes)	7.19*	3.32	.16	7.47*	3.24	.16	6.10*	2.76	.13
				4.84	6.92				
Parental age (providing the data)				.38*	.17	.18	.27	.15	.13
Mother's educational level				.03	1.16	.00	-1.18	1.01	-.08
Father's educational level				-2.56**	.91	-.24	-1.29	.79	-.24
							26.57**	7.15	

level								
Father's educational level		-1.12*	.54		-.18	-.41	.45	-.06
						26.57*	7.15	
Giftedness_Learning						-.29*	.12	-.20
Giftedness_Motivation						.36**	.11	.29
Giftedness_Creativity						.25*	.12	.17
Giftedness_Leadership						-.68**	.08	-.59
R ²		.01	.05			.37**		
Adj. R ²		-.00	.01			.33		
ΔR ²		.01	.03			.32**		

N= 182. *p < .05; **p < .01. Model 1 included sociographic factors, such as the child's biological sex, age, presence of other siblings, and chronic illnesses. In Model 2, we included sociographic factors about the parents, such as parental age and education level. In Model 3, we added factors related to giftedness in one or more areas, including learning, motivation, creativity, and leadership.

3.3. Results for the externalising symptoms

To examine the factors contributing to externalising symptoms, we used a hierarchical regression model with three levels. The model 1 included the age and biological sex of the children (as dummy variables), the number of siblings, and chronic illness (as dummy variables). These socio-demographic variables about the parents were included in model 2 and accounted for a significant 10.6% of the variance in external symptoms of emotional and behavioural disorders. ($\Delta R^2 = .10$, $F_{\text{change}}(4,177) = 5.26$; $p = <.01$).

The age and level of education of the parents contributed an additional 6.3% to the variance, but only the father's level of education was statistically significant. Model 3 included giftedness in various areas, such as learning, motivation, creativity, and leadership.

The study found that the constructs of giftedness had a significant predictive power for externalising symptoms of emotional and behavioural disorders, adding 13.3% to the model's predictive power ($\Delta R^2 = .25.7$, $F_{\text{change}}(4,170) = 8.08$; $p = <.01$). The total predictive power of this hierarchical regression is 30.2% of the total variance.

Table 4. Hierarchical regression results for CBCL_externalization

N= 182. *p < .05; **p < .01. Model 1 included sociographic factors such as the biological sex, age,

Variable	Model 1			Model 2			Model 3		
	B	SE B	β	B	SE B	β	B	SE B	β
(Constant)	4.36*	1.81		-.09	3.80		7.18	4.32	
Biological sex of child (male)	2.50**	.79	.22	2.62**	.77	.23	2.46**	.73	.22
Age of child	-.01	.15	-.00	-.25	.17	-.12	-.23	.16	-.11
Chronic illnesses (yes)	5.37*	1.83	.21	5.50*	1.79	.21	5.06*	1.67	.19
Number of siblings	.15	.44	.02	.41	.43	.06	.45	.40	.07
Parental age (27-55)				-.09	3.80				
Mother's educational level				.26	.09	.22	.17	.09	.15
Father's educational level				.17	.64	.02	-.27	.61	-.03
							7.18	4.32	
Giftedness_Learning							-.35*	.12	-.24
Giftedness_Motivation							.11	.11	.09
Giftedness_Creativity							.42*	.13	.29
Giftedness_Leadership							-.34**	.09	-.29
							.30**		
R ²	.10**			.16*					
Adj. R ²	.08			.13			.25		
ΔR^2	.10**			.06*			.13**		

presence of other siblings, and chronic illnesses. In Model 2, we included sociographic factors about the parents, such as parental age and education level. In Model 3, we added factors related to giftedness in various areas, including learning, motivation, creativity, and leadership.

4. Discussions

The study investigated the relationship between socio-demographic factors of children and parents, factors related to giftedness, and symptoms of emotional and behavioural disorders, both externalizing and internalizing.

As anticipated, our results align with those of previous studies. For instance, Habersaat et al. (2018) found that boys exhibit a higher prevalence of behavioural problems, particularly externalizing problems, than girls. This may be due to the fact that boys tend to express emotional and behavioural problems in ways that are more

noticeable or disruptive in a classroom setting. These behaviours may include aggression, hyperactivity, or impulsivity, which can lead to earlier identification. The results indicate that male gender in children is a significant predictor of emotional and behavioural disorders, but only for externalizing symptoms. In the case of internalization symptoms, the male gender was not statistically significant.

Our model showed that the number of siblings, children's age, male biological sex, and chronic illness were significant predictors of emotional and behavioural disorders. These factors independently accounted for a significant 5.7% of the variance in emotional and behavioural disorders (CBCL_total). The chronic illness was a significant predictor for externalizing symptoms, but not for internalizing symptoms.

Studies have shown that the prevalence of psychiatric disorders is higher among people with chronic illness than in the general population (Trawicka, 2019). Additionally, chronic physical health conditions are risk factors for behaviours problems (Barlow & Ellard, 2006). In recent years, there has been an increase in externalization problems among children with chronic illnesses (McQuaid et al., 2001; Karsdorp et al., 2007), particularly when the physical illness has a negative impact on brain function. Externalizing symptoms may manifest in children with chronic illnesses as a response to illness-related frustration (Reijntjes et al., 2011).

In the second step of the hierarchical regression model, we included the parental age, i.e. the maternal and the paternal education level. The family is the primary environment for children's socialization and research has found that parental socio-demographic factors, such as low socio-economic status low parental education, housing, and the mono-parental family status can strongly predict children's dysfunctional behaviour (Dishion & Gerald, 2006; Alavi et al., 2017).

The results indicate that the parental age and parental education level significantly contributed to an additional 6% of the total variance (CBCL_total). The parental age is a significant predictor of emotional and behavioural disorders. This can be explained by the negative consequences of late childbearing, such as an increased risk of physical illnesses like an increase in BMI and hypertension, as well as an increased risk of psychopathological disorders like autism (Lee and McGrath, 2015; Sandin et al., 2012) and bipolar disorder (Menezes et al.). Additionally, Tearne et al. (2016) found a link between young maternal age and depression, anxiety, and stress, while Weiser et al. (2008) found a correlation with poor social functioning. However, some research has produced contradictory results. Several studies have found a correlation between young maternal age and behavioural problems in children, especially in boys (Lauren et al., 2010).

Previous studies have indicated that parental education level plays a crucial role in children's psychological development, with particular emphasis on the mother's education level (Cui et al., 2019). In the present study, the father's educational level was found to be a significant negative predictor of conduct disorder. However, the mother's educational level did not show any statistical significance for internalization and externalization disorders. Alavi et al. (2017) found that children with mothers who had a university degree had lower scores for externalizing disorders compared to those with mothers who had a college diploma or only a high school education. In their study, the education level of the father was significantly negatively correlated with higher externalizing disorders in children (Alavi et al., 2017).

In the next step of the model, we included the giftedness factors of learning, motivation, creativity, and leadership. These factors contributed an additional 26.8% of significant predictive power to the complete model. All of the giftedness factors were statistically significant predictors of emotional and behavioural disorders.

The additional aim of our study was to examine whether giftedness predicts internalising and externalising symptoms of emotional and behavioural disorders. The results indicate that giftedness explains a higher percentage of the total variance in internalisation symptoms, compared to the total variance in externalisation symptoms. This result confirms that gifted children are primarily characterized by internalizing symptoms, such as anxiety (Guignard et al., 2012; Kermarrec et al., 2020), low self-esteem (Peperkorn et al., 2020), and excessive perfectionism (Mofield et al., 2015). In the case of the internalization symptoms, learning and leadership are significant

negative predictors, while creativity and motivation are positive and statistically significant predictors.

Externalization symptoms were predicted by factors related to learning, creativity, and leadership. However, only creativity had a positive predictive value. While creativity plays an important role in students' cognitive abilities, research suggests that it can also be associated with behavioural problems (Cropley et al., 2008; Gino & Ariely, 2012; Lüdeke et al., 20-22; Petrou et al., 2018).

Research suggests that creative individuals may engage in rule-breaking and unconventional behaviour as a result of thinking outside of cultural norms and rules, which are often symbolised as a 'box' (Petrou et al., 2018; Shin & Zhou, 2007). These individuals break these rules to develop innovative solutions. Leadership and interpersonal skills are essential for fostering healthy relationships. Children who struggle to fit in with their peers and exhibit deficits in social management skills may become aggressive and be rejected by the group. Other studies in the research literature (Kewalramani & Singh, 2017) support this finding. Additionally, several studies have investigated the relationship between socio-emotional disorders and intellectual giftedness (Francis et al., 2016; Neihart et al., 2016; Guénolé et al., 2013).

The giftedness factor was found to be the most important variable in predicting total emotional and behavioural disorders. This finding supports the hypothesis that there may be a relationship between emotional and behavioural disorders and giftedness, which is consistent with the literature (Kermarrec et al., 2020; Pepercorn et al., 2020).

5. Conclusions and limitations

Understanding the protective and risk factors for internalization and externalization symptoms of emotional and behavioural disorders is crucial for early interventions. The study results suggest that the biological male sex of child and the chronic illness are significant predictors for externalization symptoms.

Our results support the aforementioned explanations and demonstrate a negative correlation between fathers' educational level and the internalization and externalization symptoms. A strong relationship was found between giftedness and both the externalization and internalization symptoms. The evidence suggests that giftedness has a greater predictive power for internalization symptoms than for externalization symptoms.

Previous studies have reported higher rates of internalization problems in females and higher rates of externalization symptoms in males. However, in our study, we did not examine the gender-based differences, due to the small number of females in our sample, which is one of the identified limitations. Another limitation is that we did not analyze parental employment or other relevant data on the family socio-economic status, which is an aspect that remains to be explored in the future. The design of the study was a cross-sectional one, which limits our ability to clarify causal relationships between targeted variables. As we used self-reported questionnaires, another limitation pertains to the subjective appraisal of the participants, which may influence the research conclusions.

Conflict of interests

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Data availability Statement

Open Data: The information needed to reproduce all of the reported results is available at <https://doi.org/10.6084/m9.figshare.25078127.v1>

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