Original Article

Emotional and behavioral problems in pre-adolescents classified as at-risk newborns

Problemas emocionais e comportamentais em pré-adolescentes classificados como recém-nascidos de risco

Problemas emocionales y de comportamiento en preadolescentes clasificados como recién nacidos de riesgo

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Abstract

Objective: To identify the prevalence of emotional and behavioral problems in pre-adolescents classified at birth as at-risk newborns and associated factors.

Methods: This is a cross-sectional study nested in a cohort, carried out with 155 pre-adolescents (aged between 10 and 12 years) included at birth in the Newborn at Risk Surveillance Program in Maringá and their mothers/guardians. Initial cohort data referring to birth and feeding in the first six months of life and current data collected in 2019 and 2020 were used. The Strengths and Difficulties Questionnaire (SDQ) was applied to verify emotional and behavioral problems. Descriptive statistics were used for data analysis, and chi-square and Fisher's exact tests were applied to verify the association between variables.

Results: SDQ scores indicated emotional and behavioral problems in 20.0% of pre-adolescents, with a higher prevalence among boys (25.3%), a higher frequency of conduct problems (20%) and hyperactivity (26.7%). In female pre-adolescents, a higher prevalence of abnormal classification on the SDQ related to emotional symptoms (41.3%) and peer relationships (21.3%) was observed. The altered SDQ score was associated with black/brown color/race and history of congenital anomalies. Among the current factors, an association of altered SDQ with diagnoses of Attention Deficit Disorder, hyperactivity, use of psychotropic drugs and school failure was observed.

Conclusion: The prevalence of emotional and behavioral problems in the population studied is considered high and is associated with sociodemographic and perinatal factors and current living conditions.

Resumo

Objetivo: Identificar a prevalência de problemas emocionais e comportamentais em pré-adolescentes classificados ao nascimento como recém-nascidos de risco e fatores associados.

Métodos: Estudo transversal aninhado a uma coorte, realizado com 155 pré-adolescentes (idade entre dez e 12 anos) incluídos ao nascimento no Programa de Vigilância do Recém-Nascido de Risco de Maringá e respectivas mães/responsáveis. Foram utilizados dados iniciais da coorte, referentes ao nascimento e alimentação nos primeiros seis meses de vida e dados atuais, coletados em 2019 e 2020. Aplicou-se o Strengths and Difficulties Questionnaire (SDQ) para verificar os problemas emocionais e comportamentais. Para análise dos dados foi utilizada estatística descritiva, e aplicados os testes de qui-quadrado e exato de Fisher para verificar associação entre as variáveis.

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Resultados: Os escores do SDQ indicaram problemas emocionais e comportamentais em 20,0% dos pré-adolescentes, com maior prevalência entre os meninos (25,3%), maior frequência de problemas de conduta (20%) e hiperatividade (26,7%). Nas pré-adolescentes do sexo feminino foi observado maior prevalência de classificação anormal no SDQ relacionada a sintomas emocionais (41,3%) e no relacionamento com colegas (21,3%). O escore de SDQ alterado apresentou associação com cor/raça preta/parda e histórico de anomalias congênitas. Entre os fatores atuais, observou-se associação de SDQ alterado com diagnósticos de Transtorno de Déficit de Atenção, Hiperatividade, uso de psicotrópicos e reprovação escolar.

Conclusão: A prevalência de problemas emocionais e comportamentais na população estudada é considerada alta e apresenta associação com fatores sociodemográficos, perinatais e condições atuais de vida.

Resumen

Objetivo: Identificar la prevalencia de problemas emocionales y de comportamiento en preadolescentes clasificados al nacer como recién nacidos de riesgo y factores asociados.

Métodos: Estudio transversal anidado de cohorte, realizado con 155 preadolescentes (edad entre diez y 12 años) incluidos al nacer en el Programa de Vigilancia del Recién Nacido de Riesgo de Maringá y sus respectivas madres/responsables. Se utilizaron datos iniciales de la cohorte, referentes al nacimiento y alimentación en los primeros seis meses de vida y datos actuales, recopilados en 2019 y 2020. Se aplicó el Strengths and Difficulties Questionnaire (SDQ) para verificar los problemas emocionales y de comportamiento. Para el análisis de los datos, se utilizó la estadística descriptiva, y se aplicaron las pruebas de Ji cuadrado y exacta de Fisher para verificar asociaciones entre las variables.

Resultados: La puntuación del SDQ indicó problemas emocionales y de comportamiento en el 20,0 % de los preadolescentes, con mayor prevalencia entre los niños (25,3 %), mayor frecuencia de problemas de conducta (20 %) e hiperactividad (26,7 %). En las preadolescentes del sexo femenino se observó una mayor prevalencia de clasificación anormal en el SDQ relacionada con síntomas emocionales (41,3 %) y en las relaciones con compañeros (21,3 %). La puntuación de SDQ alterada estuvo asociada con color/raza negra/parda e historial de anomalías congénitas. Entre los factores actuales, se observó una asociación de SDQ alterado con diagnósticos de Trastorno de Déficit de Atención, Hiperactividad, uso de psicotrópicos y reprobación escolar.

Conclusión: La prevalencia de problemas emocionales y de comportamiento en la población estudiada está considerada alta y presenta una asociación con factores sociodemográficos, perinatales y condiciones actuales de vida.

Introduction

There has been an increase in the prevalence of mental disorders in populations in developing countries, constituting an important public health problem with marked consequences for society as well as a high social and economic cost.[1] Mental disorders are related to suffering and functional disability, which can have dramatic consequences for affected people and also for their families and their social and work environments.[2]

In this scenario, there is an increase in the onset of mental disorders in childhood and adolescence, with implications for cognitive development and learning ability.[3] In a systematic review, which included studies from 19 countries from all regions of the world, a prevalence of common mental disorders among adolescents was estimated at 31%.[4] In Brazil, among adolescents, depression is the third most prevalent disease, and suicide, the second leading cause of death.[5]

Adolescence, according to the World Health Organization, is the period between 10 and 19 years and can be subdivided into pre-adolescence (ten to 14 years) and adolescence itself (15 to 19 years). This phase is characterized by intense changes, which can have a positive or negative impact, depending on the individual and social context in which they are inserted.[5]

Research carried out in the countryside of the state of São Paulo showed contexts of intense suffering, feelings of despair, fear, lack of control, inferiority and worthlessness, mental confusion and anguish among adolescents who experienced mental health crises, which culminated in thoughts of death, suicidal ideation and attempts and/or presentation of psychotic symptoms.[6]

Perinatal and intrauterine-related aspects, such as age and maternal health status, prenatal care, socioeconomic level, birth weight, prematurity and congenital malformation, have emerged as factors that influence the growth and development of children, generating changes immediately perceptible at birth, as well as problems that will be observed throughout development, during school age and later years, including adolescence.[7,8]

A study carried out with premature infants followed up at the Outpatient Clinic of Children at Risk of the *Hospital das Clínicas* at UFMG found that, at school age, 31% of them had emotional and behavioral problems, and this finding was associated with gestational age at birth.[9] In a systematic

review that sought to assess and synthesize studies on the relationship between birth weight and cognitive function in advanced age, it was found that it is influenced by nutrition and the environment at the beginning of life. Both birth weight and socioeconomic status were associated with cognitive function from childhood to adulthood.[8]

Consulting the scientific literature on the subject, gaps are identified on risk factors related to the development of mental disorders among adolescents from underdeveloped and developing countries.[8,10] In the last five years, studies published on the topic in the national scenario were carried out with data from the birth cohort of Pelotas and addressed the relationship between mental disorders with breastfeeding and maternal and perinatal risk factors.[10,11]

Considering the above, the expansion of investigation of risk factors and early detection of mental health problems in the Brazilian context prove to be important. Understanding the etiology of childhood and adolescent mental disorders may provide new insights, not only on how to improve well-being at these developmental periods, but also on how to prevent adverse long-term outcomes.[12]

Thus, the question is: what is the prevalence of emotional and behavioral problems in pre-adolescents, who were considered at-risk newborns, and what factors may be related to these problems? To answer them, we set as objective to identify the prevalence of emotional and behavioral problems in pre-adolescents classified at birth as at-risk newborns and associated factors.

Methods

This is a cross-sectional, descriptive and analytical study conducted with mothers/guardians and pre-adolescents, aged between 10 and 12 years, classified at birth as at-risk newborns. The study is part of a cohort initiated in 2008, with newborns from Maringá, Paraná, who were included in the Risk Newborn Surveillance Program (PVRNR - *Programa de Vigilância do Recém-Nascido de Risco*).

In 2008, 802 children were included in the PVRNR, of which 249 were part of the cohort. In the present stage, carried out between 2019 and 2020, 158 participants (64.5%) remained, now in the pre-adolescence phase, and their respective mothers/guardians. Losses resulted from not being located after attempts at telephone contact and visiting the address (58), refusal (17), change of city of residence (14) and death (2). In addition to the losses, it was decided not to include in this analysis three pre-adolescents with severe neurological limitations, resulting from cerebral palsy, which prevented the application of the research instrument used, totaling 155 pre-adolescent participants.

Data collection was carried out in home visits, which started in February 2019 and ended in March 2020, due to the social distancing measures imposed by the COVID-19 pandemic. They were only resumed in October 2020, with the flexibility of the measures, and closed in November 2020. It is noteworthy that, of the total number of pre-adolescents included in the analysis, in 33 of them visits were carried out after this flexibility.

Previously collected variables were used, which were registered in the cohort database, namely: race/color, maternal age at birth, sex, birth weight, gestational age, 5-minute Apgar, type of childbirth and exclusive breastfeeding (EBF) up to six months of age.

In the pre-adolescence phase, the Strengths and Difficulties Questionnaire (SDQ) was applied to mothers/guardians to identify emotional and behavioral problems, and another questionnaire, which addressed maternal/guardian marital status, maternal/guardian education, socioeconomic classification, presence of maternal psychiatric disorder, presence of paternal psychiatric disorder, previous diagnosis of Attention Deficit Disorder in the child, hyperactivity and emotional/anxiety disorder, history of school failure and use of psychotropic medications (information and diagnoses reported by mothers/guardians). The Andrews Faces Scale was applied to pre-adolescents, which assesses psychological well-being. The presence of emotional and behavioral problems was considered an outcome variable, identified according to the total score obtained with the application of SDQ.

The SDQ is widely used to track emotional and behavioral problems from ages four to 17,

with satisfactory levels of validity and reliability.[13] The SDQ version applied to parents/guardians was used, which is useful in identifying mental health symptoms in children and adolescents, who could, out of embarrassment, omit the reality about their behavior.

This instrument is available free of charge in more than 40 languages, including Portuguese. It consists of 25 questions, ten about capabilities, 14 about difficulties and one neutral, distributed into five subscales, referring to emotional symptoms, conduct problems, hyperactivity, relationship problems and prosocial behavior. For each of the five subscales, the score can vary from zero to ten, and the total score of difficulties generated by the sum of the results of all subscales, except for sociability, which can vary from zero to 40 points. For analysis purposes, total scores above 17 points were considered abnormal.[13]

It is noteworthy that SDQ responses should take into account the behavior in the last six months;[13] however, in the case of interviews carried out after the period of social distancing by COVID-19, mothers/guardians were asked to base their responses on pre-adolescents' conditions in the period before the pandemic.

Psychological well-being was assessed using the Andrews Faces Scale, which contains seven figures representing facial expressions ranging from extreme happiness to extreme sadness.[14] To apply the scale, pre-adolescents were asked to mark the figure that most resembled the way they felt about their lives. For analysis purposes, the responses were categorized in a binary way, so that faces 1, 2 and 3 represented well-being, and faces 4, 5, 6, 7, impaired well-being.

Data analysis was performed using SPSS software, version 20.0, using absolute and relative frequency distribution of variables by total difficulties. The prevalence of emotional and behavioral problems was calculated by sex (number of pre-adolescents with abnormal SDQ classification/total of pre-adolescents in the analyzed group x 100). To verify the association between independent variables and SDQ, SDQ "borderline" and "abnormal" classifications were grouped in the "altered" category, and the chi-square test for heterogeneity was applied in cases where the lowest expected value was greater than five. In other situations, Fisher's exact test was used. P-values lower than 0.05 were considered statistically significant.

The study complied with ethical principles for research involving human beings, and was approved by the proposing institution's Research Ethics Committee (Opinion 2,797,330 – At the beginning of the cohort, Opinion 451/2008). All guardians signed the Informed Consent Form in two copies, and pre-adolescents signed the Informed Assent Form.

Results

Pre-adolescents were aged between 10 and 12 years and more than half (51.6%) were male. In the analysis of the SDQ results, the mean absolute score for the total difficulties was 11.61 with a standard deviation of 6.74 minimum score of zero and maximum score of 33 points (Table 1).

Table 1. Mean, standard deviation (SD), minimum and maximum of the total difficulty score (SDQ) and subscales

Subscales	Mean ± SD	Maximum	Minimum
SDQ* - Total difficulties	11.61±6.74	33	0
Emotional symptoms	4.17±2.46	10	0
Conduct problems	1.85±2.26	10	0
Hyperactivity	3.91±3.04	10	0
Peer relationship problems	1.69±1.86	9	0
Prosocial behavior	8.75±1.96	10	1

* SDQ – Strengths and Difficulties Questionnaire.

Among the 155 pre-adolescents in the study, 101 (65.2%) had a total difficulty score (SDQ) classified as normal, 23 (14.8%) borderline and 31 (20%) abnormal, which indicates emotional and behavioral. It is noteworthy that no significant difference was observed between the results of pre-adolescents visited before the pandemic and those visited after the flexibility of social distancing measures. In fact, the mean of difficulties in these was lower (9.97) than in the previous ones (12.06) (data not shown in table). A higher prevalence of abnormal classification of difficulties was observed among boys (25.3%) as well as

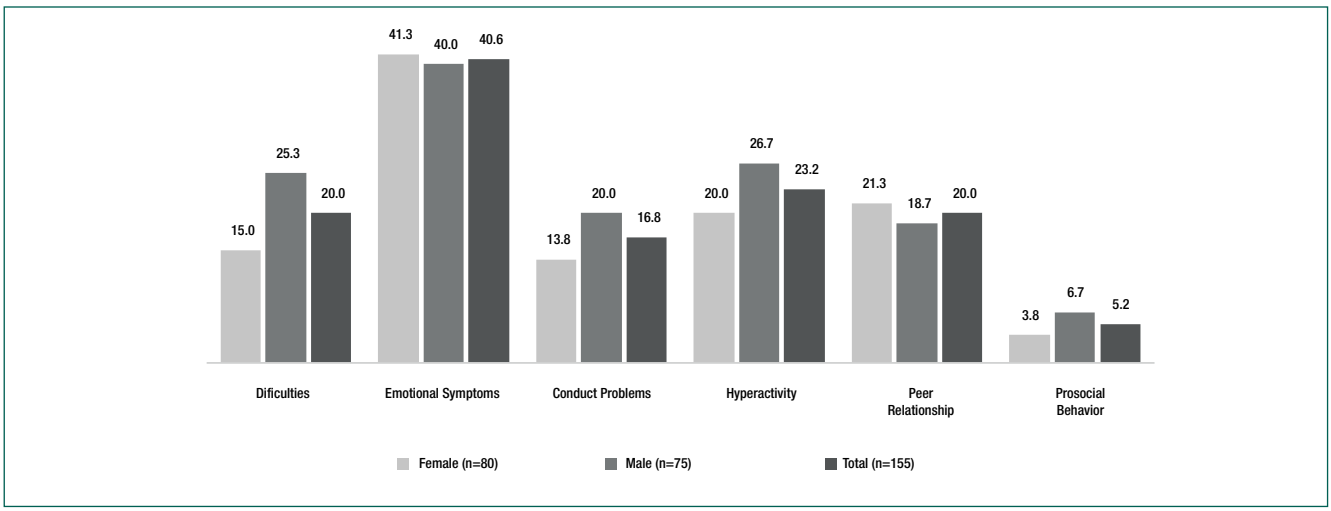

Figure 1. Prevalence (%) of abnormal score for emotional and behavioral problems according to sex in pre-adolescents classified as at-risk newborns at birth

in the conduct problems (20%) and hyperactivity (26.7%) subscales. In contrast, girls had a higher prevalence of abnormal classification in the subscales of emotional symptoms (41.3%) and peer relationship (21.3%) (Figure 1).

Regarding socioeconomic variables, 113 adolescents studied in public schools and 42 in private schools (data not shown in table). In table 2, there is a significant association (p<0.05) between color/black/brown race and change in total difficulties.

In table 3, data related to participants' perinatal factors and current conditions and their associations are presented below.

There is a positive association between the presence of anomaly at birth with a higher total score of difficulties in the SDQ in the pre-adolescence phase (p-value=0.05). Among those with anomaly, 74% had altered SDQ score. Congenital anomalies identified were hydrocephalus (3), cleft palate (1), genetic syndrome (1), polydactyly (1) and ambiguous genitalia (1).

Regarding current conditions, a positive association between the use of psychotropic drugs and altered SDQ was also identified, and, among participants, 18 pre-adolescents (11.6%) used these drugs, and of these, nine (5.8%) for Attention Deficit Hyperactivity Disorder (ADHD), mainly methylphenidate. Also, an association was observed between altered total score of difficulties (SDQ) and school failure (p-value=0.019).

Table 2. Socioeconomic and family factors, and association with alterations in the difficulty score

Variables	Total n(%)	Difficulty score – SDQ[a] Normal n(%)	Difficulty score – SDQ[a] Altered* n(%)	p-value[b]
Race/color				
White/yellow	104(67.1)	74(71.2)	30(28.8)	0.025
Black/brown	51(32.9)	27(52.9)	24(47.1)	
Maternal age**				
≥ 18 years	116(74.8)	74(63.8)	42(36.2)	0.538
< 18 years	39(25.2)	27(69.2)	12(30.8)	
Mother's or guardian's marital status				
With a partner	123(79.4)	84(68.3)	39(31.7)	0.109
Without a partner	32(20.6)	17(53.1)	15(46.9)	
Mother's or guardian's education				
≥ 8 years of study	111(71.6)	72(64.9)	39(35.1)	0.902
< 8 years of study	44(28.4)	29(65.9)	15(34.1)	
Socioeconomic classification (ABEP)[c]				
A, B1, B2	77(49.7)	51(66.2)	26(33.8)	0.781
C1, C2, D-E	78(50.3)	50(64.1)	28(35.9)	
Maternal psychiatric disorder				
No	142(91.6)	94(66.2)	48(33.8)	0.371
Yes	13(8.4)	7(53.8)	6(46.2)	
Paternal psychiatric disorder				
No	151(97.4)	100(66.2)	51(33.8)	0.088
Yes	4(2.6)	1(25.0)	3(75.0)	

*sum of borderline and abnormal classification; ** age at the time of pre-adolescents' birth; a) SDQ – Strengths and Difficulties Questionnaire; b) Chi-square test of heterogeneity; c) ABEP – Brazilian Association of Research Companies.

Discussion

The results of the present study showed that 20.0% of pre-adolescents had a total score of difficulties, according to the SDQ instrument, classified as abnormal. It is evidenced=that the prevalence of emo-

Table 3. Participants' perinatal factors and current conditions and association with alterations in total difficulties (SDQ)

Variables	Total n(%)	Difficulty score – SDQ[a]		p-value[b]
		Normal n(%)	Altered* n(%)	
Perinatal factors				
Sex				
Male	75(48.4)	48(64.0)	27(36.0)	0.769
Female	80(51.6)	53(66.3)	27(33.8)	
Birth weight				
≥ 2500g	82(52.9)	51(62.2)	31(37.8)	0.411
< 2500g	73(47.1)	50(68.5)	23(31.5)	
Gestational age				
≥37s	67(43.2)	46(68.7)	21(31.3)	0.425
<37	88(56.8)	55(62.5)	33(37.5)	
5-minute Apgar				
≥ 7	141(91.0)	89(63.1)	52(36.9)	0.140[c]
< 7	14(9.0)	12(85.7)	2(14.3)	
Anomaly				
No	148(95.5)	99(66.9)	49(33.1)	0.05[c]
Yes	7(4.5)	2(28.6)	5(71.4)	
Type of childbirth				
Vaginal	41(26.5)	27(65.9)	14(34.1)	0.914
Caesarean section	114(73.5)	74(64.9)	40(35.1)	
Exclusive breastfeeding up to 6 months				
Yes	50(32.3)	30(60.0)	20(40.0)	0.352
No	105(67.7)	71(67.6)	34(32.4)	
Current conditions				
Psychological well-being (face scale, n=137)				
Yes	126(92.0)	83(65.9)	43(34.1)	0.516[c]
No	11(8.0)	6(54.5)	5(45.5)	
Screen time (n=128)				
≤2 hours/day	42(32.8)	27(64.3)	15(35.7)	0.926
>2 hours/day	86(67.2)	56(65.1)	30(34.9)	
Diagnosed ADHD				
No	142(91.6)	97(68.3)	45(31.7)	0.007
Yes	13(8.4)	4(30.8)	9(69.2)	
Diagnosed emotional disorder/anxiety				
No	135(87.1)	94(69.6)	41(30.4)	0.002
Yes	20(12.9)	7(35.0)	13(65.0)	
School failure				
No	120(77.4)	84(70.0)	36(30.0)	0.019
Yes	35(22.6)	17(48.6)	18(51.4)	
Use of psychotropic drugs				
No	137(88.4)	95(69.3)	42(30.7)	0.003
Yes	18(11.6)	6(33.3)	12(66.7)	

*sum of borderline and abnormal classification; a) SDQ – Strengths and Difficulties Questionnaire; b) Chi-square test of heterogeneity; c) Fisher's exact test.

tional and behavioral problems in this age group was higher than the results found in other studies in Brazil[15,16] and in the international scenario.[17,18]

The population-based study carried out with children born in Pelotas, for instance, also used SDQ, and found a prevalence of 14.2% of difficulties at abnormal levels.[15] In Belo Horizonte, in a study with 124 pre-adolescents (ages between 12 and 14 years), the prevalence of difficulties at abnormal levels identified was 7.3%.[16] However, it is important to note that this was carried out only with students from private schools, a population that is generally better socioeconomically, whereas in the present study, those included were students from public and private schools.

Research carried out in India identified that 13.6% of adolescents aged 11 to 19 years had abnormal total difficulties, however, the authors emphasized that the study was carried out in schools and the school dropout rate in the country is high, with variations of 20-30%. In this case, the authors believe that the difficulties may have been underestimated, as the socio-economically disadvantaged population was not included.[17,18]

In a time series analysis carried out with data from 34 countries in North America and Europe, a positive relationship between socioeconomic status and psychological symptoms was found, with a progressively greater difference over time.[19] In the same sense, data from the BELLA Cohort of studies (mental health module of the German Health Interview and Examination Survey for Children and Adolescents – KiGGS) point out that adolescents with low socioeconomic status are more susceptible to psychological problems.[20]

In this study, a higher prevalence of alteration in SDQ results was observed among boys, with emphasis on conduct and hyperactivity problems. On the other hand, in girls, the prevalence of abnormal classification in relation to emotional symptoms and peer relationship was higher. It is emphasized that differences between the sexes are already reported in the scientific literature, which indicate a higher occurrence of mood disorders in females, while behavioral disorders are more frequent in males.[17, 21-23]

In Slovakia, abnormal SDQ scores were found at 13 years in 12.1% of boys and 16.2% of girls, with changes at 15 years for 10.4% and 19.6%, respectively. These data indicate a difference between the sexes and a worsening in the scale of behavioral and emotional problems among girls during adolescence.[18] In this direction, in a Chinese study carried out with 6400 children and adolescents, boys exposed a greater propensity than girls to present

high total difficulties, as well as problems of conduct, peer relationship, hyperactivity, and prosocial behavior, while girls had a greater propensity for emotional problems.[22]

As for color/race, an association was found with emotional and behavioral problems, corroborating the results of a study in Pelotas, Rio Grande do Sul, in which a higher prevalence of problems was found in black/brown pre-adolescents.[23] The relationship between mental disorders and ethnic and racial factors is multidetermined and complex, being subject to different interpretations that can mix science, ideology and structural racism. It is necessary to recognize racism as one of the social determinants of health and disease, producing various forms of emotional discomfort and also the possibility that forms of social suffering are reduced to mental disorders, individualizing and depoliticizing broader problems.[24]

Regarding prematurity and low birth weight, no significant associations with emotional and behavioral problems were identified, a result that is different from other studies.[9,25] It is noteworthy that differences in the socioeconomic scenario and, consequently, in the postnatal environment, have an impact on the behavioral outcome and can overcome neonatal morbidity, which emphasizes the importance of the postnatal period as a protective factor against the development of behavioral disorders.[26]

The only perinatal factor associated with pre-adolescent emotional and behavioral symptoms was congenital anomaly. The family difficulties in the case of anomalies may start before the affected individual is aware of it. The arrival of a baby with a congenital malformation causes a rupture related to the idea of the perfect birth, with negative feelings, not only for the parents, but for the whole family. After birth, it is common for mothers to worry about the prejudice of others, fear of social non-acceptance of their children throughout life, feelings of shame, and comparison of "normal" with "abnormal" and between perfect and imperfect. Coping with and elaborating on reality occurs without major damage when the diagnosis is made early, even during pregnancy, and if there is family support.[27]

Considering that newborns experience feelings together with the mother, it is possible that this period of maternal adaptation to the diagnosis influences children's emotional health in the future. Moreover, in pre-adolescence, insecurity about body image is common, and physical alterations resulting from congenital anomalies can impair the perception of body image and emotional health at this stage.[28]

In addition to emotional problems, there is currently an increase in behavioral disorders, especially ADHD. According to the reports of mothers/guardians, 8.4% of pre-adolescents had a previous medical diagnosis of this disorder, which was significantly associated with an altered SDQ score. Some studies indicate an association between the development of ADHD and long exposure to screens and excessive use of digital media in childhood and adolescence;[29,30] however, this association was not identified in the present study.

Analogously to the increase in emotional and behavioral problems, the use of psychotropic drugs is increasingly observed among children and adolescents. A study on medicalization among schoolchildren, carried out in three municipalities in Paraná, identified that the prevalence of medication use for the treatment of ADHD was 4% to 5.21% among elementary school students,[31] a result close to that found in this study.

Despite growing concern about the increased use of psychotropic drugs among children and adolescents, this may reflect greater access to diagnosis and treatment of emotional and cognitive problems, and treatments for mental disorders are known to be more effective if started early in the course of the disease. Thus, when correctly indicated, drug treatment is important to ensure better long-term results.[32]

In Spain, symptom progression in children with ADHD was assessed with the use of methylphenidate, and the results indicated that hyperactivity improves over the first year of treatment, emotional symptoms and behavioral problems improve during the first six months, and prosocial symptoms slowly improve over two years.[33]

Furthermore, school failure was significantly associated with alterations in SDQ. A case-control study that investigated the association between school failure and emotional and behavioral symptoms in adolescents enrolled in the final years of elementary

school found that those with a history of school failure are more prone to social isolation, in addition to presenting behaviors identified as abnormal, especially on the anxiety/depression scale, compared to students without the same history.[34] This indicates that school failure when associated with emotional and behavioral symptoms cannot be assessed in isolation.

Finally, the overview found in relation to emotional and behavioral problems in pre-adolescents induces reflection on the need to plan actions and follow-up strategies for these children considered at birth as at-risk newborns during their development as well as support for future adolescents. This is a responsibility of health professionals and managers, including nurses who play an essential role in the care of children and adolescents, promoting healthy growth and development. Pre-adolescence is a subdivision of adolescence, a phase of life with intense social, family and emotional demands, and care in this cycle is essential for the future quality of life of these adolescents.

As the study limitations, we highlight the occurrence of the COVID-19 pandemic and its consequences during data collection, which may have influenced the SDQ results, even though it was pointed out to the interviewees that the responses should be based on pre-adolescents' conditions in the period before the pandemic

Conclusion

The prevalence of emotional and behavioral problems in pre-adolescents classified at birth as at-risk newborns was 20%, with a significant association between the total altered difficulties and sociodemographic and perinatal factors and current health conditions. Although not statistically significant, the frequency of difficulties was higher among boys, who had more conduct problems and hyperactivity, while girls had a higher frequency of emotional symptoms and difficulties in peer relationships. As implications for practice, we highlighted the importance of preventing complications during pregnancy, childbirth and birth to prevent the birth of at-risk newborns. In addition to this, Investments are necessary in the monitoring of these children in the development period, paying attention to their demands for special care for a better quality of life in adolescence and adulthood.

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Collaborations

Reis P, Marcon SS, Ichisato SMT, Bernardino FBS, Neves ET, Silva DAR, Vieira VCL and Zani AV contributed to study design, data analysis and interpretation, article writing, relevant critical review of intellectual content and approval of the final version to be published.

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