SEÇÃO: ARTIGO

Suicidal ideation in mothers of asthmatic children and adolescents in a subspecialty outpatient practice

Ideação suicida em mães de crianças e adolescentes asmáticos em ambulatório especializado

Ideación suicida en madres de niños y adolescentes asmáticos en consulta externa de subespecialidad

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Abstract: We aimed to investigate prevalence and factors associated with Suicide ideation (SI) in mothers of asthmatic children. This cross-sectional study included 362 dyads of mothers and children with asthma aged 2 to 14 years who attended two pediatric outpatient clinics in Brazil. We assessed the presence of SI (Self-Report Questionnaire-20), the occurrence of stressful events and maternal social support. The prevalence of SI was 8.6%. Low maternal education, exposure to *serious illness*, and low perception of social support in its affective–social interaction dimension remained significantly associated with SI in the final model. Thus, life stressors, social support and low maternal education accounted for most of the variation in prevalence of maternal SI. There were no effects of child asthma severity on maternal SI in this study.

Keywords: suicidal ideation, mental health, maternal behavior, asthma

Resumo: Nosso objetivo foi investigar a prevalência e os fatores associados à ideação suicida (IS) em mães de crianças asmáticas. Este estudo transversal incluiu 362 díades de mães e crianças com asma de 2 a 14 anos em dois ambulatórios pediátricos no Brasil. Avaliamos a presença de IS (Self-Report Questionnaire-20), a ocorrência de eventos estressantes e o suporte social materno. A prevalência de IS materna foi de 8,6%. Escolaridade materna inferior a oito anos, doença materna grave e a baixa percepção de suporte social em sua dimensão afetivo-social permaneceram significativamente associadas à IS no modelo final. Portanto, eventos estressores maternos, suporte social e baixa escolaridade materna foram os responsáveis pela maior parte da variação na prevalência de IS materna. Não houve efeitos da gravidade da asma infantil na IS materna neste estudo.

Palavras-chave: ideação suicida, saúde mental, comportamento materno, asma

Resumen: Este estudio investigo la prevalencia y los factores asociados con ideación suicida (IS) en madres de niños asmáticos. Participaron 362 díadas de madres y niños con asma de 2 a 14 años en dos clínicas pediátricas ambulatorias en Brasil. Evaluamos la presencia de IS (Self-Report Questionnaire-20), la ocurrencia de eventos estresantes y el apoyo social materno. La prevalencia de IS materno fue del 8,6%. La educación materna de menos de ocho años, la enfermedad materna grave y la baja percepción de apoyo social en su dimensión afectivo-social se mantuvieron significativamente asociadas con el SI en el modelo final. Entonces, los eventos de estrés materno, el apoyo social y la baja educación materna explicaron la mayor parte de la variación en la prevalencia materna de IS. No hubo efectos de la gravedad del asma infantil en el IS materno en este estudio.

Palabras clave: ideación suicida, salud mental, conducta materna, asma

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Every year, over 800,000 people die from suicide worldwide (World Health Organization, 2014). Suicide is the 15th most common cause of death and accounts for 1.4% of all deaths globally; 75.5% of these deaths occur in developing countries (Cha et al., 2018; Turecki & Brent, 2016; World Health Organization, 2014, 2017). Suicidal behavior is a spectrum that includes suicidal ideation (SI), planning, attempt, and the action of committing suicide itself (World Health Organization, 2014). However, suicidal ideation (SI) inclusion in suicidal behavior is controversial because the factors associated with SI may differ from the factors underlying suicide attempt and suicide itself (Klonsky et al., 2016; Wetherall et al., 2018; World Health Organization, 2014). The SI prevalence was 9.2% in a multicenter study involving 17 countries. Studying SI and its determinants is important because up to 60% of the transitions to suicide planning and attempt can occur in the first year after suicidal thoughts are developed (Nock et al., 2008).

As SI can be an important predictor of death by suicide (Nock et al., 2008; World Health Organization, 2014), it is extremely important to identify SI as a topic for planning suicide prevention. Some theories regarding suicide and suicidal behavior are rooted in the ideation-to-action framework. These theories consider SI development and SI transition to suicide attempt as distinct processes (Joiner, 2005; Klonsky & May, 2015; Klonsky et al., 2017; O'Connor, 2011). The Three-Step Theory (3ST), for example, hypothesizes that: 1) SI results from the combination of pain (mainly psychological) and hopelessness; 2) among those who experience one or both, connectedness is a crucial protective factor against the escalating SI and 3) progression from ideation to attempts depends on dispositional, acquired, and practical contributors to the capacity to attempt suicide (Klonsky & May, 2015; Klonsky et al., 2017). Regarding the first and second steps of 3ST, stressful life events (SLE) may act as a trigger and social support as a protective factor on the escalating SI. In the first case, association between negative stressful situations and SI and behavior was generally consistent (Liu & Miller, 2014).

As caring for patients with chronic mental or physical illness can be a stressful event, a growing number of studies have investigated aspects of the caregiver's mental health, including SI, whose prevalence may range from 10.3 to 18% (Huang et al., 2018; Koyama et al., 2017; O'Dwyer et al., 2016; Park et al., 2013; Skeen et al., 2014). Studies revealed much heterogeneity, with SI prevalence depending on child's illness type and other factors associated with the caregiver, such as the presence of CMD, depression, and anxiety, social support, age, and associated chronic disease (Huang et al., 2018; O'Dwyer et al., 2016; Park et al., 2013; Skeen et al., 2014). Being single, female, and unemployed; having low perception of social support; and presenting a mental disorder have been frequently identified as factors for increased risk of SI among caregivers (Huang et al., 2018; O'Dwyer et al., 2016). In the particular case of children, studies evaluating the presence of suicidal thoughts in their caregivers, especially mothers (if we consider that they are the main caregivers in this age group), are lacking. (Lise et al., 2017).

Moreover, no studies have tested any type of socioeconomic and/or psychosocial model for SI in mothers of children with asthma, the most prevalent chronic disease in childhood. (Asher & Pearce, 2014; Global Initiative for Asthma, 2015) Thus, this study aims to investigate the socioeconomic and psychosocial factors that are associated with an increased prevalence of SI in mothers of asthmatic children in subspecialty outpatient practice. Since having a child with asthma can be a stressful event for the mother, we will consider the additional stress of severe asthma in the child as a determinant for SI in these mothers.

Methods

Participants

This study was conducted in two public pediatric pulmonology outpatient clinics that are reference for attendance of children and adolescents in the state of Alagoas, Brazil. Eligible participants were mothers of asthmatic children aged 2 to 14

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years selected by convenience.

A total of 481 eligible mothers were invited to participate in the study. Once they agreed to participate and signed a consent form, a face--to-face interview was conducted in a private room before medical appointment. Seventeen mothers refused to participate, and 102 questionnaires were excluded due to inconsistencies in their completion or by noting that mothers were embarrassed to complete one or more items in the questionnaire.

Mother-child dyads included mainly male children, mothers with low education, and severe financial problems (see table 1 for detailed information on socio-demographic characteristics, maternal factors, and asthma severity in the sample).

Measurements

Maternal SI. Information about maternal SI was obtained through the question "Have you had thoughts about ending your life in the past 30 days?" from the Self Report Questionnaire (SRQ-20). This is a common mental disorder (CMD) screening questionnaire comprising 20 questions and dichotomous answers (yes/no) on symptoms over the previous 30 days and validated in Brazil (Harding et al., 1980; Mari & Williams, 1986). Participants were divided into groups of mothers with and without SI.

Maternal stressful life events (SLE). The occurrence of maternal stressful life events (SLE) in the previous 12 months was measured through nine close-ended questions about events or unpleasant situations taking place over the previous 12 months, with dichotomized answers in *yes* or *no* – exposed or non-exposed, respectively (Lopes & Faerstein, 2001). Each one of the nine events was evaluated as an isolated variable (serious illness, hospitalization, death of close family member, severe financial problems, change of residence, separation/divorce, physical aggression, mugging/robbery). This questionnaire showed good test-retest reliability, with most of the questions having a good stability when reported by adults in a previous study in Brazil (Lopes & Faerstein, 2001).

Maternal Social Support. Maternal social support was assessed using the Social Support Scale (Medical Outcomes Study Questions; MOS--SSS). The instrument consisted of 19 questions and answers on a five-item Likert scale ("never" – 1, "rarely" – 2, "sometimes" – 3, "almost always" – 4 and "always" – 5), validated for the Brazilian population (GRIEP et al., 2005). For the purposes of this study, the items were organized to cover three dimensions of social support: 1) affective–positive social interaction (7 items), 2) emotional–informational (8 items), and 3) material support (4 items) (Griep et al., 2005). The higher the score, the greater the perception of social support. The scores in each dimension were dichotomized at high and low, using the first distribution quartile as a cut-off point.

Support from relatives and friends. Support from relatives and friends was measured through the questions: 1) "How many relatives do you feel comfortable with and can talk about almost everything?" and 2) "How many friends do you feel comfortable with and can talk about almost everything?", also extracted from MOS-SSS mentioned above. Both variables were dichotomized based on presenting or not support from relatives or friends, at least one.

Covariates. Child's asthma severity was considered an adjustment variable, as this sample consists of mothers of asthmatic children. Child's gender, child's age, maternal age, maternal educational level, economic classification, and maternal smoking were considered as possible adjustment variables if they achieved significance (p<0.05) in the bivariate analysis for predictors of SI in the mothers. Asthma severity was defined based on the type of medication that was being used (Global Initiative for Asthma, 2015) and was categorized as mild or moderate to severe for analysis. For economic classification, the ABEP (*Associação Brasileira de Empresas de Pesquisa*) questionnaire was used, which categorizes economic classes as A, B, C, D, and E, in witch A was the highest and E was the lowest. For analysis, the economic classes were dichotomized in A/B/C

and D/E.

Procedures

This was a cross-sectional study conducted between June 2015 and December 2017 in two outpatient pediatric clinics in the State of Alagoas, Brazil. Participants included dyads of mothers and their respective asthmatic child aged 2 to 14 years. The data were collected through structured interviews with the mothers and by using data from patients' medical records.

After the Informed and direct consent was obtained from the mothers, questionnaires were applied. Application of the instrument (face-to-face), as well as the interview environment (waiting room) were used to minimize the gaps in filling in the questionnaires. However, the interviewees might have felt embarrassed with one or more items in the questionnaire. When this happened, we invalidated the instrument entirely and the participant was excluded from the research. When the mothers answered positively to the question "Have you had thoughts about ending your life in the past 30 days?", they were referred to the clinic's psychology service for follow-up. This assurance complies with items III, III.2 of the Guidelines and Regulatory Norms for Research Involving Humans, RESOLUTION No. 466, of the Brazilian NATIONAL HEALTH COUNCIL.

The Research Ethics Committee of the Federal University of Alagoas approved this study with the protocol number 1.091.863.

All the analyses were conducted using the STATA version 13.0 program. Association between the presence of maternal SI and categorical independent variables was analyzed by means of the qui square test. The variables that presented association at a level of $p \leq 0.05$ in the bivariate analysis with SI entered a multivariate regression model. Estimates by point (prevalence ratio; PR) and adjusted 95% confidence intervals (95% CIs) were calculated by using Poisson regression with robust variance in order to produce point and interval estimates that were lower than those obtained using logistic regression which would overestimate the associations for outcomes (Coutinho et al., 2008). A value of $p < 0.05$ was considered as statistically significant in the multivariate regression model.

To quantify the additional contribution of each group of independent variables to the variation observed in the dependent variable (maternal SI) explained by the model, such groups of interest variables were progressively added. Contribution with the addition of each group of variables to the model was measured by change in R^2. Successive models for association with maternal SI were: 1) socio-demographic factors; 2) Model 1 + perception of maternal social support; 3) Model 2 + maternal exposure to SLE in the previous year; 4) Model 3 + asthma severity.

Results

The maternal SI prevalence in the previous month was 8.6%. All mothers with SI also had evidence of common mental disorder (CMD), with eight or more positive answers to SRQ-20, a cut-off point defined in the Brazilian validation of the questionnaire (Mari & Williams, 1986). Half of the mothers in the sample had CMD. Almost half of the dyads belonged to economic classes D and E. Exposure to severe financial problems was the most frequently reported SLE in the previous year, followed by loss of a close relative (Table 1).

Table 1 – Socio-demographic characteristics, maternal factors and asthma severity of the sample (n=362)

Characteristics	N (%)
Maternal SI*	31 (8,6%)
Maternal CMD**	183 (50,55%)
Gender of the child, male	232 (64,09%)
Age of child (≤ 5 years)	161 (44,48%)
Asthma severity in the child (moderate / severe)	146 (40,33%)
Maternal age (> 35 years)	116 (32,04%)
Maternal education (less than eight years)	212 (58,56%)
Economic class (D/E)	175 (48,34%)
Maternal smoking	18 (4,97%)
Affective – positive social interaction support, low	82 (22,65%)
Emotional – informational support, low	91 (25,14%)
Material support, low	103 (28,45)
Relatives support (none)	64 (17,68%)
Friends support	166 (45,86%)
Maternal stressful life events (SLE) in the last year (2 or more)	190 (52,49%)
Serious illness	105 (29,01%)
Hospitalization	29 (8,01%)
Death of close family member	116 (32,04%)
Severe financial problems	206 (56,91%)
Forced change of residence	63 (17,40%)
Separation/divorce	50 (13,81%)
Mugging/robbery	39 (10,77%)
Physical aggression	17 (4,70%)
Discrimination	14 (3,87%)

* CMD: Common mental disease; **SI: Suicidal ideation

Bivariate Relationships between maternal SI, sociodemographic characteristics, maternal psychosocial factors, and Child's Asthma severity. Mothers with less than eight years of schooling and mothers belonging to economic classes D and E showed a positive association with SI (PR: 2,95; CI95%: 1,24 – 7,02 and PR: 2,24; CI95%: 1,09 – 4,63, respectively). Child's asthma severity was not associated with maternal SI report (Table 2).

Table 2 – Clinical and sociodemographic characteristics of the mother-child dyads, according to the presence of SI (n=362)

Characteristics	Without SI (n=331)	With SI (n=31)	PR	CI (95%)	p
Gender of the child, Male	213 (64.3%)	19 (61.3%)	0,89	0,44 – 1,77	0,73
Age of child, ≤ 5 years	149 (45.0%)	12 (38.7%)	0,79	0,39 – 1,58	0,50
Asthma severity in the child, Moderate / severe	131 (39.6%)	15 (48.4%)	1,39	0,71 – 2,72	0,34
Maternal age, > 35 years	105 (31.7%)	11 (35.5%)	1,17	0,58 – 2,35	0,67
Maternal education, Less than eight years	187 (56.5%)	25 (80.6%)	2,95	1,24 – 7,02	0,01*
Economic class (*ABEP*), D/E	154 (46.5%)	21 (67.7%)	2,24	1,09 – 4,63	0,03*
Maternal smoking, Yes	16 (4.8%)	2 (6.4%)	1,32	0,34 – 5,10	0,69

* p < 0,05

* ABEP: Associação Brasileira de Empresas de Pesquisa

Among the maternal psychosocial factors, perception of low social support in its three dimensions and exposure to most stressors in the previous year (serious illness, hospitalization, separation/divorce, and being victim of physical aggression and discrimination) were significantly associated with maternal SI (Table 3). Interpersonal support provided by relatives was also inversely associated with maternal SI.

Table 3 – Maternal psychosocial characteristics, according to the presence of SI (n=362)

Characteristics	Without SI (n=331)	With SI (n=31)	PR	CI (95%)	P
Serious illness	90 (27.2%)	15 (48.4%)	2,29	1,18 – 4,47	0,01*
Hospitalization	21 (6.3%)	8 (25.8%)	3,99	1,96 – 8,13	<0,01*
Death of close family member	103 (31.1%)	13 (41.9%)	1,53	0,78 – 3,02	0,22
Severe financial problems	184 (55.6%)	22 (71.0%)	1,85	0,88 – 3,91	0,11
Forced change of residence	58 (17.5%)	5 (16.1%)	0,91	0,36 – 2,29	0,84
Separation/divorce	41 (14.4%)	9 (29.0%)	2,55	1,25 – 5,23	0,01*
Mugging/robbery	34 (10.3%)	5 (16.1%)	1,59	0,65 – 3,91	0,31
Physical aggression	11 (3.3%)	6 (19.3%)	4,87	2,31 – 10,28	<0,01*
Discrimination	10 (3.0%)	4 (12.9%)	3,68	1,49 – 9,10	0,01*
Low Affective – positive social interaction support	62 (18.7%)	20 (64.5%)	6,21	3,10 – 12,43	<0,01*
Low Emotional – informational support	78 (23.6%)	13 (41.9%)	2,15	1,10 – 4,22	0,02*
Low Material support	88 (26.6%)	15 (48.4%)	2,36	1,21 – 4,59	0,01*
No support from relatives	53 (16.0%)	11 (35.5%)	2,56	1,29 – 5,08	0,01*
No support from Friends	151 (45.6%)	15 (48.4%)	1,11	0,56 – 2,17	0,77

* p < 0,05

Maternal SI, Stressors, Social Support and Child's Asthma severity: a series of Multivariate Models. To predict the dependent variable maternal SI, we estimated a series of regression models to identify the independent contributions of socio-demographic factors, social support, life stressors and childhood asthma severity to maternal SI. The variables that presented association at a level of p < 0.05 with SI entered the multivariate regression model. Although asthma severity was not associated with maternal SI in the bivariate analysis, we added this variable to the model to identify a possible strengthening or buffering effect of it on the other variables. In this multivariate model, we accounted for elements of the socio-demographic factors of mother-child dyads first, describing the relationships of social support and stressors to the mother's SI before we incorporated the additional stress of child's asthma severity (Table 4). Support from relatives and perception of social support added 16% of explanation to the SI model in this study measured by change in R^2. Thus, social support explained a considerable amount of additional variation in maternal SI, over and above socio-demographics factors. The included SLE added 7% to the explanation provided by socio-demographic factors and social support. Inclusion of asthma

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severity did not explain additional variation in the cumulative model of maternal SI to the model, as observed by unaltered R^2. Maternal exposure to severe illness and the low social support in their affective–social interaction dimension remained significantly associated with SI in the final model, even with the addition of child's asthma severity to the model. The complete model accounted for 27% of maternal SI in this sample.

Table 4 – Multivariate regression model for SI asthmatic children and adolescents' mothers

SI	Model 1 socio-demographic factors (R^2 0,04)	Model 2 (Model 1 + perception of maternal social support) (R^2 0,20; Change in R^2:0,16)	Model 3 (Model 2 + maternal exposure to SLE in the previous year) (R^2 0,27; Change in R^2:0,07)	Model 4 (Model 3 + asthma severity) (R^2 0,27; Change in R^2:0,00)
	PR (CI 95%)	PR (CI 95%)	PR (CI 95%)	PR (CI 95%)
Economic classification (D/E)	1.36 (0.56 – 3.29)	1.18 (0.54 – 2.60)	1,03 (0.43 – 2.51)	1.03 (0.40 – 2.66)
Maternal educational level < 8 years of schooling	2.85 (0.96 – 8.44)	2.51 (0.97 – 6.52)	2,59 (1.05 – 6.38)*	2.59 (1.04 – 6.47)*
Low Affective – positive social interaction support		6.43 (2.37 – 17.46)*	6.86 (2.66 – 17.71)*	6.86 (2.67 – 17.65)*
Low Emotional – informational support		1.08 (0.49 – 2.38)	1.10 (0.54 – 2.22)	1.10 (0.53 – 2.27)
Low Material support		0.98 (0.44 – 2.18)	0.73 (0.29 – 1.80)	0.73 (0.30 – 1.79)
No support from relatives		2.09 (0.99 – 4.42)	2.05 (0.94 – 4.48)	2.05 (0.91 – 4.64)
Serious illness			3.25 (1.27 – 8.27)*	3.24 (1.25 – 8.44)*
Hospitalization			1.02 (0.36 – 2.87)	1.02 (0.36 – 2.93)
Separation/divorce			1.11 (0.45 – 2.76)	1.11 (0.45 – 2.75)
Physical aggression			2.61 (0.89 – 7.65)	2.62 (0.83 – 8.25)
Discrimination			1.66 (0.74 – 3.74)	1.66 (0.69 – 3.99)
Asthma severity				1.00 (0.45 – 2.30)

* $p < 0,05$

Discussion

This study including mothers of asthmatic children in a subspecialty outpatient practice regarding suicidal thoughts in the previous month found a SI prevalence of 8.6%, which was similar to that found in a previous multicenter study – 9.2% (Nock et al., 2008). Thus, there does not seem to exist a higher prevalence of SI in this population. SI prevalence can differ from one study to another depending on the evaluation method (response to only one question or a specific questionnaire, population characteristics, and assessment time – if ever in life, the previous month, or the previous year). For example, a study involving young adults in Scotland revealed up to 23% of suicidal thoughts at one time in life and 10.6% in the previous 12 months (O'Connor et al., 2018). In Brazil, a study carried out with pregnant women and using a methodology like the methodology described here found SI prevalence of 6.3% (Huang et al., 2012).

Based on the assumption that context matters, we built the mother's social context by creating a model of demographics, social support and life stress that served as a backdrop for the additional stress of having a child with severe

asthma. By looking further into the model, we found that demographics mattered somewhat, but the lack of social support and experience of life stressors explained more of the presence of maternal SI. Moreover, the child's actual asthma severity had not a relationship to the mother's SI and did not make an additional contribution to the relationship between the psychosocial variables and maternal SI.

Different from previous studies evaluating the presence of SI in caregivers of individuals with chronic diseases such as HIV, chronic kidney disease, cerebrovascular disease, mental disorders, and cancer (Huang et al., 2018; Park et al., 2013; Skeen et al., 2014), we assessed whether the severity of the disease was associated with the presence of SI. We observed a lack of association between disease severity in child and the presence of maternal SI, including child's asthma severity to the multivariate analysis model. Although prospective studies with a larger number of subjects should confirm or not this lack of association, it seems that having a child with severe asthma *per se* may not be causally related to maternal SI. Asthma severity is a possible stressor, but other events related to interaction with the environment and social support may exert a greater influence on suicidal thinking, possibly related to the individual's inherent feeling of non-belonging and non-connectivity regardless of the amount of care that is required.

In line with the 3ST theory, which considers that events that cause pain and hopelessness trigger IS, we identified in our study that the SLE serious illness increased the risk of SI in mothers of children with asthma. In addition, low social support on its affective and social interaction dimension remained associated with SI in an adjusted analysis, strengthening the idea contained in the 3ST hypothesizing that connectedness may act as a protective factor against progression of SI. Thus, in mothers of asthmatic children, the event serious illness (a trigger) and the lack of affective and social interaction support (the connectedness protective factor) are important determinants of suicidal thinking in mothers caring for children

with a chronic condition.

Several factors, mainly psychosocial factors, are associated with SI in caregivers including CMD, depression, anxiety, low perception of social support, exposure to stressful events, low quality of life, and coping strategies (Huang et al., 2018; O'Dwyer et al., 2016; Park et al., 2013; Skeen et al., 2014). For SLE, studies involving caregivers are lacking. The most common SLE identified in a British study involving 1066 patients with psychological morbidity and SI were loss of family or friend, interpersonal conflicts, severe illness, financial crisis, and interpersonal violence (McFeeters et al., 2015). In an epidemiological study conducted in the United States involving 34,653 adults with major depressive disorder, SI was associated with stressors loss or victimization, problems with interpersonal relationships, serious problems with neighbors, friends, or relatives, and financial difficulties (Wang et al., 2015). Although the above-mentioned stressors were associated with SI in other studies, in the present study, only the event severe illness remained associated with SI after multivariate analysis.

In relation to social support, previous studies shows that it exerts an effect on SI among adolescents by mediating its relationship with stressors (Kang et al., 2017). Further, the lack of support from relatives has also been associated (in the unadjusted analysis) with the presence of SI in caregivers of patients with physical and mental illness in a tertiary hospital in Taiwan (Huang et al., 2018). The present study adds that perceived lack of social support in their affective–social interaction dimension was significantly associated with SI in mothers of asthmatic children, in an adjusted model.

Among the socio-demographic factors associated with SI occurrence, only the maternal schooling factor remained statistically significant after adjusted analysis. A study in Korea evaluated the risk factors for SI in migraine patients and, through logistic regression analysis, found that patients with SI were more likely to have a low educational level - measured in years of study - as compared to patients without SI (Kim & Park,

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2014). Among caregivers of cancer patients, being female, single, and unemployed were also socio-demographic factors associated with higher risk of SI (Park et al., 2013).

This study had some limitations. First, because of its cross-sectional design, we were not able to determine cause and effect relationship between SI and the considered factors. Because both the exposure and outcome are determined at the same time, no temporality between these variables can be inferred. However, the present study was useful to provide a snapshot of the association between SI and maternal psychosocial at one point in time whose direction of effect can be better indicated in a prospective study. Second, some possible confounding factors may have affected self-reporting of SI and attempts, including educational level, understanding and interpretation of the questionnaire, and respondent's willingness to disclose this information (World Health Organization, 2014). Application of the instrument (face-to-face), as well as the interview environment (waiting room) were used to minimize the gaps in filling in the questionnaires. However, the interviewees may have felt embarrassed, which may have altered their responses and consequently underestimated the results of the questions related to the stressor physical aggression event and the presence of SI for example. The researchers in relation to the risks of constraints offered guarantee of data confidentiality and withdrawal from the study without consequences for the treatment of the child to the research participants. Finally, there is no questions about frequency, intensity, or duration of SI in the suicide item of the SRQ-20, thus limiting its ability to assess the severity of suicidality.

Despite these concerns, the present study has many important strengths, such as demonstrating a model where the psychosocial context explains much more IS in mothers of asthmatic children than the severity of the disease in the child. Moreover, it raises the possibility of identifying maternal SI and associated factors in a routine outpatient child consultation by means of a simplified instrument with rapid application (20-30 minutes). There was no need for the interviewers to go through complex training. The instrument could be useful mainly in the context of primary healthcare, could be applied in an outpatient waiting room, is easily accessible, and has low cost for the health system. Once the risk is identified, the caregiver should be referred to specialized care for appropriate diagnosis and treatment. The importance of identifying SI and associated factors could enable early intervention and prevention or block the process leading from ideation to suicidal behavior through active search in an interview with mothers. In addition, providing support to the mother will probably improve their children's asthma status.

Conclusions

The SI prevalence in asthmatic children's mothers was the same as in the general population. Previously described psychosocial factors, as maternal education, exposure to stressors (in this case, serious illness) and low perception of social support in their affective–social interaction was also significantly associated with SI in mothers of asthmatic children. Our results points to the lack of association between severity of disease in children and SI in their mothers. In general, the presence of SI is better explained by the experience of life stressors and low perception of social support. Finally, the current study suggests that it is possible to identify maternal SI and associated factors with the aid of a simplified instrument during a routine visit to a child outpatient unit.

Conflicts of interest

The authors declare that they have no conflict of interest.

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