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The "choking game": a new craze among Brazilian children and young people. Psychophysiological, behavioral and epidemiological characteristics of 'asphyxial games'

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Abstract *The 'choking game' is a risk-taking behavior that has spread quickly among children and young people, causing dependence, accidents and even death, including in Brazil. These activities are performed in order to experience fleeting euphoric sensations, attracting numerous participants through the thousands of videos posted on YouTube. The problem of 'asphyxial games' can be observed in the Brazilian digital media, although there is a lack of scientific studies. Through a systematic review of the literature and complementary material, this paper aims to address the 'asphyxial games', warning about the psychophysiological and behavioral effects of these practices, while also presenting international epidemiological data. Sharing this information in academic circles is extremely important given the need to acquire more knowledge on the topic, train professionals and propose preventive measures that raise awareness among children and young people of the potential danger of voluntary fainting. It is equally important to raise awareness among parents and teachers so they can identify the warning signs that children may be engaging in these practices. And finally, it is also necessary to request government support to control exposure to videos that encourage the behavior.*

Key words *Choking game, Asphyxial behaviors, Risk behaviors, Internet, Children and adolescents*

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Introduction

Numerous children and adolescents in different countries have suffered fatal accidents resulting from self-asphyxiation or voluntary fainting encouraged by peers in the so-called choking game[1-4]. These asphyxial practices have grown increasingly more prolific among young people, including in Brazil, as a result of their exposure to countless videos on the internet, making it a public health issue in many countries.

The games involving apnea and asphyxia are risk behaviors that meet one of the three categories of 'dangerous games': 'non-oxygenation games', 'physical aggression games' and 'challenge games', mainly via the internet[5,6].

These non-oxygenation practices caused by asphyxia are not new and the first lethal 'games' were recorded in France and England[7] in the 1950s. The origin of these behaviors dates back to ancient times, when syncope was used by Greek philosophers to induce a state of trance. There are also accounts from anthropologists[8] in the 1940s of Eskimo children who would provoke temporary asphyxiation and lose consciousness, in some cases presenting auto-erotic characteristics.

Starting in 2000, 'asphyxial games' became more widespread among young people, mainly in the United States[9] and France[10], and the cases of deaths started to be reported in the printed and television media. Later, the topic captured the interest of the academic community[11]. However, until 2016, there were no scientific studies in Portuguese on these types of behaviors.

Considering this fact and after conducting research on 'non-oxygenation games' in a French sample[12], we decided to study this phenomenon in Brazil. This paper aims to address the characteristics of 'asphyxial games', warning about the psychophysiological and behavioral effects and the inherent dangers of these risk activities, while also commenting on epidemiological data from different countries. Accordingly, we conducted a survey of the international scientific literature, also using complementary material and information available in the digital media on the problem of asphyxial behaviors in Brazil.

Methodology

We conducted a systematic review of the literature on 'asphyxial games' in six electronic scientific databases: PubMed-Medline, Science Direct, PsycInfo, CAIRN, Lilacs-BVS and Scielo, for publications between 1950 and 2016. The search was made in three languages, using any of the terms *brincadeira do desmaio*, *choking game*, *jeux d'asphyxie* in all fields. Only complete articles available in electronic periodicals and focusing on children and adolescents were considered. The exclusion criteria were: duplicate articles; papers containing only the title or the abstract; indexes, summaries or editorials; adult population; texts on auto-erotic asphyxia and indirect mentions of 'asphyxial games' (for example, in an article on binge drinking). For the bibliographic management, the Zotero program version 4.0.29 was used. We also used complementary material such as books and conference material as well as videos and Brazilian and foreign digital media reports.

Results

The bibliographic search in electronic databases resulted in 126 articles distributed in accordance with the flow chart in Figure 1. The screening process excluded 73 articles: 29 were duplicates, 27 were incomplete, 7 were editorials or indexes, 5 focused on the adult population or auto-erotic asphyxia and another 5 were papers that only indirectly addressed the topic of 'asphyxial games'.

Therefore, a total of 53 scientific articles were eligible for this study. Of these, 36 are in English, 16 in French and just 1 in Spanish. None were found in Portuguese. The articles were dated from 2001 to 2016 and the majority (n = 30) were published between 2009 and 2012.

Considering the vast amount of material consulted and keeping in mind the goals of this paper, we made a selection of the information resulting from this review of scientific literature and complementary material. This information was compiled into the following thematic topics: 1. *What are 'asphyxial games';* 2. *Psychophysiological aspects;* 3. *Behavioral risk factors* and 4. *Epidemiological data.* The information obtained from searches on websites and the Brazilian digital media about 'asphyxial games' in the country were included in a fifth topic: *What has been happening in Brazil.*

What are 'asphyxial games'?

Asphyxial or non-oxygenation 'games' are risk behaviors that are self-inflicted individually or collectively by children or adolescents by using apneal, strangulation or compression techniques in order to obtain a brief state of euphoria, some-

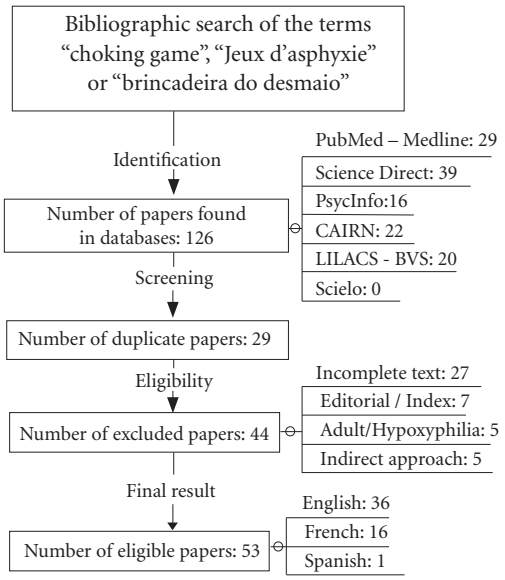

Figure 1. Flow Chart of the Bibliographic Search and Selection Process in Electronic Databases containing one of the terms "choking game", "jeux d'asphyxie" or "brincadeira do desmaio".

times causing voluntary or accidental fainting, which can be fatal[3,5,9]. The main characteristics of asphyxia are a blockage of the blood supply to the brain, preventing oxygen from reaching the pulmonary alveoli, either manually or with the use of instruments (scarf, belt, shoelace, rope). These asphyxial activities are practiced with the aim of experiencing fleeting euphoric sensations caused by hypoxia (reduced concentration of oxygen in the blood), such as visual and/or auditory hallucinations and bodily synaesthesia (the sensation of floating or falling), a 'sensory seism'[13] resulting from the effects of loss of consciousness caused by fainting[13,14].

These self-asphyxial behaviors were observed in children from a very early age (four years old) to young adults[1,6,12,15]. Among young adults, these behaviors are mostly related to hypoxyphilia - the restriction of oxygen to the brain associated with sexual pleasure[16,17].

Although these dangerous practices are disguised by a playful nature, they are violent, can cause dependence[18] and are potentially fatal. Therefore, these behaviors should not be considered simple 'games' and experts have advised against using this term[6,10]. Because with these risk behaviors there is no intersubjective exchange either with peers or with adults[6], preference should be given to terms such as activity, practice, conduct or behavior. This is why, in this paper, the term 'game' is used with single quotation marks when referring to self-asphyxial behaviors.

'Asphyxial games' are generally learned at school and played in groups, hidden from adults, and they are called a number of different names[10,11,13,19,20]. In Brazil, the most common are 'brincadeira do desmaio' (choking game) and 'brincadeira de parar de respirar' (blackout), as presented in Chart 1.

These names, which appear quite innocuous, regardless of the country, conceal a variety of different and complex techniques. In general, they begin with a deep inhalation of air followed by the sudden interruption of breathing, either by apnea, compression or strangulation. This is why, depending on the technique used, 'asphyxial games' are essentially classified into two groups[18,20,21]:

- *prolonged apnea*: in which the child/adolescent who can hold their breath for the longest is the 'winner', timed by either using a stopwatch or simply counting out loud. In another variant, the 'winner' is the person who can make their face the reddest, which in French is called the 'tomato game'. These activities are usually practiced by groups of small children; fainting is generally not intentional, but may occur accidentally. Some of the names for these behaviors are: 'Blackout', 'Space Monkey' and 'Suffocation Roulette'.
- *compression or strangulation*: these techniques involve compressing the carotid arteries of the neck (using hands or a belt) by the child or a colleague or strong compression of the thorax (a shove against the wall) applied by a friend. This type of technique begins with cerebral hyperventilation (in a squatting position, with one's head facing downwards) that induces a sudden cerebral hypoxia causing voluntary fainting. The sensations of dizziness, visual and auditory hallucinations and spatial-temporal confusion are experienced as 'games', to laugh at one another. Some of the names for these behaviors are: 'Choking Game', 'Speed Dreaming', 'Pass Out' and 'Funky Chicken'.

According to the literature[5,9,22], the influence of peer pressure plays a significant role in the adoption of these risk behaviors, which can occur in various different places where young people socialize, such as private condominiums, sports clubs, summer camps and also in their own homes, where the techniques are practiced alone[23].

Chart 1. Examples of the names of asphyxial games found in the French and U.S. literature and the names existing in Brazil.

United States	France	Brazil
• Choking game	• Jeu du foulard	• Brincadeira do desmaio
• Blackout	• Jeu de la tomate	• Brincadeira de parar de respirar
• Space Monkey	• Jeu du cosmos	• Desafio de quem fica vermelho mais rápido
• Speed dreaming	• 30 secondes de bonheur	• Desafio dos 30 segundos
• Suffocation roulette	• Le rêve bleu	• Desafio do cronômetro
• Pass out	• Le rêve indien	• Brincadeira de empurrar contra a parede
• Funky chicken	• Jeu de la grenouille	• Jogo de apertar o pescoço

Psychophysiological aspects of 'asphyxial games'

'Asphyxial games' involve a variety of techniques that become progressively more complex and dangerous, a fact that is generally camouflaged by the alleged playful and above all social nature of these activities[5,6]. Younger children (in pre-school or primary school) start with simple apneal behaviors, whereas older children and adolescents engage in more dangerous fainting techniques such as compression of the carotid arteries or the rib cage.

In these 'asphyxial games', four motives can be identified that lead the child/adolescent to adopt these dangerous behaviors[5,10,20]:

. *the taking of risk*: the child/adolescent plays the 'game' in order to overcome anxiety or fear of the unknown;

. *the pursuit of an intense sensation*: the child/adolescent will repeat the 'game' if their initiation experience is positive, possibly reproducing it alone; but if the experience is negative (accompanied by suffering), they are unlikely to repeat it, either alone or in a group;

. *the loss of consciousness*: the child/adolescent experiences in the 'game' the suppression of their own consciousness in an ephemeral moment in which they escape from the outside world and from all their anxieties and concerns[22,24];

. *the awakening-survival*: the child/adolescent has bad headaches after the experience but they nevertheless feel a certain omnipotence at having 'passed' a potentially fatal test[24].

Among adolescents, in addition to causing hallucinations and bodily sensations, the 'game' is a competition since it involves showing off to friends and sometimes filming the act. Hence the rule that the person who applies the 'game' on a colleague is next in turn and the rotation continues[5,6]. It is common for the child/adolescent who has been initiated by a group of friends to try to repeat the practice alone at home, using objects to provoke self-asphyxiation[5,13,25]. In doing so, they put their physical integrity at risk by gradually reducing the margin of safety[18] and steadily increasing the danger of accidents that can cause serious neurological damage or fatal accidents[2,18,25,26].

The somatic consequences of the lack of oxygen to the brain are proportional to the severity of each accident[25,27], since they are directly related to the amount of time the organs and body tissues are deprived of oxygen and how long it takes for the child/adolescent to receive assistance[20]. They are:

. *short-term hypoxia*: can cause a brief loss of consciousness. However, if the duration of the hypoxia is prolonged, there may be neuronal loss, reversible at first, with alterations of consciousness and even convulsive symptoms; but there may be lasting consequences in cases of systematic repetitions.

. *long-term anoxia (3 to 5 minutes)*: can cause irreversible brain injuries, triggering sensory-motor deficit sequelae (paralysis, paraplegia, quadriplegia), sensory sequelae (blindness, deafness), encephalopathic sequelae (cerebral pathological changes) and a neurovegetative state of deep coma or death.

The repeated practice of these 'games' is an aggravating factor that can provoke a variety of somatic sequelae, such as cognitive slowing, migraines, earache, amnesia, motor or vision disorders and even convulsions[5,25-29]. The child/adolescent may try to obtain increasingly more

sensations through self-asphyxiation[16,17,22] and the frequent repetition of these behaviors may give rise to a psychological and physical need to repeat them systematically, leading to a genuine addiction like with illegal drugs[11,18,19,30].

Behavioral risk factors of asphyxial practices

Since 2007, the French authorities have acknowledged that they are facing a serious public health problem involving young people from pre-school children to university students. This is why France's Ministry of Education has released an information guide[20] that identifies the three types of practitioners of 'asphyxial games':

. *occasional*: who are motivated by curiosity or by peer pressure;

. *frequent*: who are intent on trying to experience strong sensations, which is why they will be more likely to repeat the 'game' and play it when they are alone;

. *with vulnerable personality*: these are rarer cases, generally motivated to keep on pushing their limits, and more likely to be involved in fatal accidents.

However, authors[11,16,21,25,31,32] have stressed that most children/adolescents who take risks by engaging in asphyxial behaviors do not have the intention of dying. They are unaware that they are being auto-aggressive, but instead they are behaving like curious children and young people who are eager to experience new physical sensations[16,18] and who need to feel secure about their own sense of existence[13,33,34].

Andrew et al.[11] have identified potential subgroups, still not fully defined, that have profiles with a greater tendency to engage in 'asphyxial games': younger adolescents with attention deficit hyperactivity disorder[9,16], with anxiety or depression[3,21], who have a tendency to use drugs and alcohol[19,21], who self-medicate[3,16,35] and who have engaged in self-harm in the past 12 months[36]. These risk behaviors are associated with asphyxial behaviors during adolescence[18,26,37].

The risk of psychopathological consequences is high among children/adolescents who frequently engage in 'asphyxial games'. According to France's Ministry of Education[20], the repeated practice of 'asphyxial games' has resulted in the appearance of symptoms of depressive disorders, anxiety disorders, attention deficit, sleep disorders, hyperactivity, learning and concentration difficulties, school and/or social phobia, headaches and psychosomatic disorders (stomach aches, for example).

There are a number of warning signs that make it possible to identify when young people may be engaging in apneal or asphyxial behaviors[11,20,23], about which one ought to be aware:

Physical and psychological signs:

. frequent and severe headaches (cephalalgia);

. red marks or pigmentation around the neck (from the use of ropes or nooses);

. red pigmentation on the cheeks; bloodshot eyes (resulting from micro intraocular hemorrhage); frequent conjunctivitis;

. temporary eyesight problems (moving black dots, blurred vision);

. ringing in the ears;

. constant fatigue;

. fainting for no apparent reason;

. difficulty concentrating, forgetfulness, memory gaps for recent events.

Behavioral or external signs:

. objects such as belts, ropes, shoelaces or scarves that the child wants to keep on their person or that they leave in inappropriate places;

. hidden cords or straps (under the bedstead, in the upper level of a bunk bed or in wardrobes);

. sudden changes in behavior (particularly verbal and/or physical aggression);

. curiosity about asphyxia or about the sensations and effects of holding one's breath;

. mentioning different names of games (especially among children);

. isolation and constant requests for more privacy;

. long lengths of time spent locked in the bedroom or bathroom;

. watching videos, participating in forums and visiting websites associated with asphyxial activities.

Epidemiological data

Cases of deaths resulting from 'asphyxial games' have been formally recorded in 10 countries; however, the scientific evidence on the prevalence, risk factors and mortality levels associated with the practice of self-asphyxiation behaviors is still limited and fairly inconsistent[37].

Since they are practiced in secret, adults almost never find out about these 'dangerous games' until accidents occur[6,34] or when hospitalization is required[25]. Most of these accidents occur when the 'game' is played alone, usually at home, using some type of strap to induce cerebral hypoxia[2,6,38].

In the United States, between 1995 and 2007 there were 82 deaths caused by the choking game

among children aged from 6 to 19, most of whom (87%) were male[5]. Of these 82 accidental deaths, 67 occurred when the children were playing the 'choking game' on their own[5]. In 2005, there were 22 deaths and in 2006, 35, all caused by these choking 'games'. Toblin et al.[2] believe that this increase is the result of growing exposure in the U.S. media and television networks. In Canada, in 2006, 193 young people aged from 10 to 19 died from asphyxia, choking or strangulation, and of these 18 were identified as accidental deaths and not suicide[9].

In Europe, it is estimated that in France these 'asphyxial games' have been responsible for the death of 210 children[6]; between 1995 and 2009 there were nearly 10 deaths per year, and 25 in 2009 alone[23]. Estimates in other countries, according to Chevalier[39], are 11 deaths in Belgium in 2009; between 8 and 12 in Italy (without specifying the year); 5 or more in Switzerland in 2007; 5 fatalities in the Netherlands in 2010; and 21 in the United Kingdom in 1997 and between 12 and 15 in 2012. The author[39] notes the lack of data from Germany, Spain, Austria, Poland and Australia.

The difficulty obtaining accurate statistics on 'asphyxial games', regardless of the country, is the result of three factors that make it hard to access the information: (a) the secret nature of these 'games', which makes it difficult for adults to discover them[6,10,40], (b) the low rate of notification of suspicions by health professionals, either due to lack of knowledge[41,42] or due to ethical issues[43]; and (c) most of the deaths caused by 'asphyxial games' are interpreted by coroners as domestic accidents or suicide, which leads to the underestimation of official death rates from these dangerous practices[2,5,11,37,38].

As a result of the dramatic episodes of deaths of children and young people caused by 'asphyxial games', grieving parents have set up non-governmental organizations (NGOs) to warn of the dangers and to stop other young people from playing these dangerous 'games'. Prominent among these organizations are, in France, APEAS (*Association de Parents d'Enfants Accidentés par Strangulation*), founded in 2000; in the United States, *Erick's Cause,* founded in 2012, and GASP (*Games Adolescents Shouldn't Play*), founded in 2008 and also represented in Canada and South Africa; and in Belgium, the *Chousingha* association, founded in 2008. In Brazil, the *DimiCuida* Institute, founded in 2014 in Fortaleza, is to our knowledge one of the first Brazilian organizations that works on the prevention of these risk behaviors.

Busse et al.[37], in a systematic review of self asphyxial behaviors, obtained the following epidemiological data from studies in four countries (9 in the United States, 4 in France, 3 in Canada and 1 in Colombia) between 2007 and 2012: the participants were predominantly aged 12-17; between 4% and 16% of them had already engaged in some form of asphyxial behavior (in Colombia the figure was 54%); the majority learned the 'game' when they were aged 8-15; most discovered the 'game' through their friends at school; between 18% and 45% of the interviewees knew someone who had already engaged in an 'asphyxial game'; loss of consciousness caused by fainting was mentioned by 36% to 72% of practitioners and between 11% and 23% of them had engaged in 'asphyxial games' alone (without anyone close by).

In a pilot study[12] conducted in three French schools in 2010, we researched 246 students in the 10-14 age range (median age of 11.6), 49% girls and 51% boys. With the use of a self-administered questionnaire, we observed that:

. one in five children (21%) responded that they had engaged at least once in some 'game' involving holding one's breath, with no difference between genders;

. the age of initiation to the 'asphyxial games' at times was very young: age 4, while the median age was 8.9 years (age range of 4-12);

. 44% of players learned the 'game' at school and half of them played in groups of 3 to 9 friends;

. 46% of the children said they participated only once, 28% played between 2 and 5 times, and 21% repeated the 'game' more than 10 times;

. concerning the frequency, 45% played the 'game' occasionally, 23% played on a monthly basis and 32% at least once a week, of which 16% played every day.

In this study, it was clear that the children who had already played a 'choking game' were those who had received less prevention information from their parents or from school: 31% of the players had not received any information compared to 9% of those who had never experimented with 'asphyxial games'.

Another French study from 2015[44] reveals a significant change in the age and prevalence of 'asphyxial games': 71% of the French schoolchildren who were interviewed (N=1023) were aged from 7-9 (median age of 8.3) and were aware of at least one type of 'apneal or asphyxial game'; 59% had already played one of these 'games' at least once and 50% had already experimented

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with a 'choking game', either with the help of their friends or using some type of strap; 33% of the children discovered these risk behaviors in pre-school; 67% played the 'game' together with friends and 7% said they played alone, of which 69% were boys. Concerning the frequency, 7% played every day and 6% repeated it several times a day (of these, 91% were boys). Note that these data refer to French children aged between 7 and 9 years old.

What has been happening in Brazil?

In Brazil, these asphyxial behaviors are known mainly as 'brincadeira do desmaio' (choking game), but also as 'brincadeira de parar de respirar' (blackout) and 'brincadeira de ficar vermelho' (space monkey) (Table 1), and they are practiced in several states across the country. These activities have had growing repercussions primarily among adolescents, as can be seen on social networks and principally on *YouTube*. There are thousands of videos available showing the practice of voluntary fainting and the 'fun' being had by the participants. These videos are extremely instigative as they teach step-by-step how to reproduce the behaviors. In the literature[45,46], the harmful influence of the social networks as catalysts for the dissemination of asphyxial risk behaviors is well known.

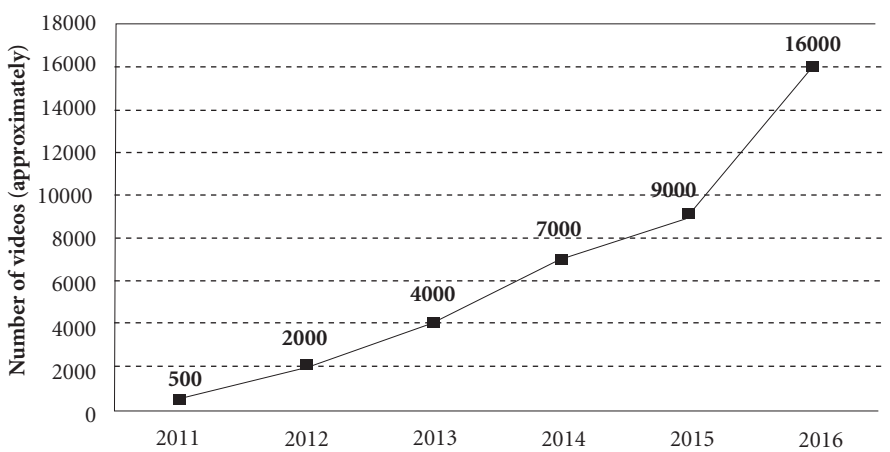
Graph 1 presents the approximate number of videos related to the term brincadeira do desmaio (choking game, without quotes) available on *YouTube Brazil* resulting from informal searches conducted between October 2011 and May 2016.

Over the past five years, there has been an exponential and alarming increase in the number of videos available containing the term 'brincadeira do desmaio' (choking game): in 2011, there were fewer than 500 videos but by 2016 this number had risen to more than 16,000 with content related to the practice of voluntary fainting. However, the numbers are significantly higher on the English *YouTube* website when searching for the term 'choking game': in 2014, there were more than 70,000 results and in 2016 there are 88,000 videos available.

The first Brazilian videos of the 'choking game' appeared 2007 and 2008 and some have received more than 50,000 views. Consequently, posting a video on the internet gives young players a certain notoriety, whether on the local level among their peers or on the national or even international level. There are also videos showing shocking scenes of adolescents who, after inducing fainting, start having an epileptic seizure and have to be woken brutally, sometimes with punches and kicks from their peers.

In the Brazilian media, the first digital and printed reports about 'asphyxial games' date back to 2007[47,48] and they warned about the existence of these behaviors and referred to the fatalities they caused in the United States and France. Since 2012, the Brazilian media – digital, printed and television – has been reporting on the accidents and deaths caused by the 'choking game' across the country[49-54].

However, there are no official numbers in Brazil on the deaths resulting from the 'game', nor is there any epidemiological data. Our team has



Graph 1. Number of videos available on YouTube Brazil with the term Brincadeira do Desmaio (Choking Game, without quotes), between October 2011 and May 2016.

conducted cross-sectional observational research (N = 1000) on 'dangerous games' and asphyxial activities, the results of which shall be published in the near future.

The first ever event on the subject in Brazil occurred in Fortaleza in August 2015, organized by the DimiCuida Institute: the *1st International colloquium on dangerous games: practices, risks and preventions in the world. Knowledge, understanding, prevention* was staged for health and education professionals. At this event, in which we gave a presentation, material was released on the topic warning of the potential dangers of these practices and the need for prevention both for children and adolescents and for parents and professionals. In this respect, an educational video in Portuguese[55] - translated by our team - was made freely available to raise awareness of the dangers of voluntary asphyxial practices.

Discussion

The asphyxial behaviors practiced by children and adolescents have become a public health issue in many countries[23,37]. For the young people who engage in these practices that test their physical capacities in a potentially fatal 'game', although hypoxia is experienced as a pleasurable moment of suffocation, the practices "provoke a sensory seism before they regain consciousness on their own or are revived by friends"[13]. These behaviors also serve to calm their apprehensions[24], through a momentary psychological or existential flight since the individual "escapes the constraints of their identity and stops being the actor of their existence by surrendering to the radiance of the mixed sensations that invade them"[13]. Many adolescents, when engaging in these behaviors alone, do so particularly in times of annoyance, frustration, anguish and anxiety, and often seeking to avoid the "fear of being afraid"[13,24,30,33].

The incessant pursuit to experience strong sensations fills children, and adolescents in particular, with a feeling of personal strength or power[13,30]. By feeling courageous and daring to play these dangerous 'games', often filming and posting them online, the child or young person shares their sensations and their experiences with their friends, developing the feeling of belonging to a group[5]. According to Breton[13], these behaviors are part of a youth culture of secret 'games' wherein the group is almost always present to shield the participants, keeping its activities carefully hidden from the watchful eyes of parents and teachers. This only serves to strengthen the bonds between the members of the group and encourages them to engage in these forbidden behaviors. The young person feels appreciated and respected by being part of this closed and secret circle, with the feeling of contributing with their personal excellence[13].

This feeling of personal omnipotence and of belonging to the group is reinforced when the young person shares videos on the internet, gaining notoriety among their peers. With the advent of the internet, given the speed of the flow of information, the participant can, in a short space of time, be 'viewed' or 'followed' by thousands of other young people. The *modus operandi* of the videos found on *YouTube* serves as a catalyst for others to reproduce the same behavior. Studies[45,46] reveal a direct influence between the use of this website and the learning and spread of 'asphyxial games', and it is alarming in the United States "the drastic increase in choking game-related videos on *YouTube* within the last five years, and the variety of asphyxial methods in use, making prevention efforts extremely necessary"[46] – a situation also observed on *YouTube Brazil* (Graph 1).

In this regard, the French Senate approved in 2011 the Hadoppi - LOPPSI 2 Law, which punishes the production and dissemination of any content that incites minors to engage in games that could put them physically at risk. As a result, any French video that shows these risk behaviors must be blocked by the website providers. If a video is posted and reported, it must be immediately removed from the internet under penalty of three years in prison or a fine of up to 75,000 euros for the offenders. However, this type of ban is not enforced in other countries, including the United States, which has contributed a great deal to the proliferation of videos that encourage the behavior.

Other aggravating factors are the early age at which children have been starting to engage in asphyxial behaviors and the lack of information on these types of conduct: nearly 60% of children aged between 7 and 9 have already tried an apneal 'game'[12,44], of which half (50%) have already induced fainting[44]; many of these behaviors start early at 4 years of age[12,23]; and most participants are less aware of the potential risks of asphyxia than those who have never tried these activities[9,12,27,44].

Also notable are the numerous somatic and psychological consequences resulting from the systematic practice of 'asphyxial games', giv-

en that there are cases of dependence in which asphyxia is performed several times every day. This requires adults to be aware of the physical, psychological and behavioral signs of the practitioners so they can advise them adequately: tell them about the hazards of the practice, take them for medical or psychological consultation, schedule a meeting with school officials, among other things.

Conclusion

We cannot overlook the major growth and popularity of asphyxial and induced fainting practices over the past decade in various countries around the world, including in all regions of Brazil[49-54]. Andrew et al.[11] say that "although asphyxial games have been played for decades, the medical and scientific literature makes few mentions of this phenomenon"[11], meaning there is a shortage of etiological data on these 'games'[2]. There is, therefore, a pressing need for new studies on these dangerous behaviors, particularly in Brazil and Latin America, where data is lacking.

It is extremely important for Brazilian governmental institutions to be involved at the federal, state and municipal levels to warn and inform the population about the existence and lethal nature of the 'choking game' and other 'dangerous games' that have been widely circulated on the internet.

There is, therefore, an urgent need to adapt national legislation to address the circulation and access of content on the internet that shows behaviors that are potentially dangerous to young people. Like in France, legislation is required to block and remove all videos that encourage such behaviors on the social media, particularly *YouTube*, and also effectively punish future offenders.

The information and prevention efforts should be undertaken together with the areas of health and education, by training qualified professionals to raise awareness among adults, parents, teachers and medical staff. These, in turn, should work on raising the awareness of children and young people, warning them of the real dangers about which they are not always aware.

This awareness raising should not be coercive, but instead allow the emergence of knowledge in various fields, such as biological (the importance of the respiratory system) and psychosocial (knowing how to say no to these 'games' and warning both those who engage in them and adults). Children and young people should themselves be on the front lines of raising awareness and disseminating information that saves lives.

Collaborations

J Guilheri worked on the preparation of the project, the development of the research, the data analysis and the writing of the article. L Yazigi and A Andronikof served as advisors throughout the entire research process and participated in the analysis and revision of the manuscript.

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