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Questionable child deaths in Riyadh, Saudi Arabia: Retrospective Study

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Abstract

Background: Despite the efforts of the governmental child protection programs, child fatalities due to maltreatment remain a serious problem in Arab countries.

Results: This retrospective study identified 87 as a total questionable child death (QCD) cases in Riyadh, the capital of Kingdom of Saudi Arabia. 52 victims (60%) were Saudi children. Nearly one-third (29%) of the cases involved the death of children ages 1–5. 21 QCDs occurred in middle and the eastern regions of the country. QCDs were most commonly reported as accidental (29%), followed by homicidal (25%). A parent was the main assailant in (38%) of the homicidal cases, and the child's relative was reported in (18%). Wounds were detected as the cause of death in 39 cases (45%). Upon examination, child negligence was reported or observed in 5 cases.

Conclusion: This study provides appropriate data for planning preventive measures.

Keywords: Forensic medicine, Questionable child deaths, Riyadh

Background

The death of any child is a heartbreaking tragedy for the child's family, and surrounding community. Most child fatalities are the result of natural or accidental causes. When a child dies unexpectedly, law enforcement investigators is called to determine whether there was any criminal activity involved. If so, the incident was reported as a questionable child death (QCD) (Walsh, 2017).

Child fatalities related to maltreatment, abuse, and negligence occur worldwide. The detection and prevention of such crimes are the basic tenets underlying all child protective services (Pritchard, 2014).

In 2003, UNICEF reported that 3500 children under the age of 15 die each year from abuse or neglect in 27 rich countries. The lowest child fatality rates were found in Spain, Greece, Italy and Ireland. While, the United States and Mexico had the highest child fatality rates (UNICEF, 2003).

The Worldwide Health Organization (WHO) estimates that 57,000 children die annually as a result of maltreatment. The rate of death in low- to middle-income

countries was higher than in high-income countries. Africa had the highest homicide rate of children under the age of 5. The rate was higher for boys than girls (World Health Organization, 2006).

International data for child deaths from accidental and deliberate causes are not as robust as deaths from childhood diseases. National laws and practices for the investigation, verification, and registration of such deaths vary widely, which impacts the accuracy and timeliness of the data (Child killings in England and Wales, 2014).

In Saudi Arabia, physical abuse represented the most common type of child maltreatment from 2000 to 2008. Negligence was the second most commonly-cited cause (Al Eissa & Almuneef, 2010). According to Dr. Maha Almuneef, Executive Director of the National Family Safety Program in Saudi Arabia, the number of child deaths as a result of domestic violence were as follows: 5 in 2010, 6 in 2011, and 12 in 2012 (Haddad & Habbib, 2012). Many significant physical and sexual assaults were referred to law enforcement officials for investigation; however, serious criminal cases were only prosecuted in court based on the General Criminal Bylaw (Almuneef & Al-Eissa, 2011).

Saudi Arabian laws state that the examination after death should be performed when a hospital doctor or

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police officer suspects that the death was caused by criminal activity. The doctor or police officer should describe the conditions (e.g. a strange smell in the case of poison or a wound in the case of a crime) which led him/her to this belief, and this information is shared with a forensics expert, who will perform an external examination of the body as well as any related objects (e.g. clothes and personal objects). If the expert deems that an internal examination is necessary to identify the cause of death, he/she must obtain permission from the authorities (Atighetchi, 2007).

Riyadh is the capital and largest city of the Kingdom of Saudi Arabia. It is situated in the center of the Arabian Peninsula on a large plateau. Riyadh, composed of 19 governorates and 1 sub-governorate, is home to 7.3 million people. There are no published data concerning medico-legal characteristics of QCDs in Riyadh (Cybriwsky, 2013; Riyadh Region, 2017).

Saudi Arabia, especially Riyadh, has significantly improved its health services and awareness; nevertheless, no studies have been conducted to investigate the country's questionable child death rate. Due to the before mentioned reason and to aid in monitoring, evaluating then reducing questionable child deaths, This study was designed to examine the QCD incidences, demographics, and medico-legal characteristics in Riyadh from November 2013 to October 2015.

Method

Eighty-seven cases of QCDs were included in this retrospective study. The cases were referred to Riyadh's forensic medicine center between Muharram 1435 (November 2013) to Dhul-hijja 1436 (October 2015).

QCDs are defined as when a child (up to 18 years old) (Almuneef & Al-Eissa, 2011) unexpectedly dies and law enforcement investigators are asked to determine whether there was any criminal activity involved (Walsh, 2017). After securing the Riyadh Forensic Center's approval, the case files were reviewed. The data—victim age, victim gender, residency, date, location of death, injuries sustained, cause, manner of death, and identity of the perpetrator if homicide is suspected—were collected and analyzed using SPSS version 15 (SPSS Inc., Chicago, IL, USA).

Results

Within the 2-year study period, 1837 persons were referred to Riyadh's Forensic Medicine Center with the indication of suspicious death. QCDs were detected in 87 cases (4.7%). 76 cases (88%) were victims of known identities and 52 cases (60%) were Saudi children [Table 1].

Regarding the victims' sex, 55 (63%) were boy and 32 (36%) were girl [Table 1]. Moreover, the QCD mean age was 8.6 ± 6.2 years. The age group (1–5 years) was the largest group (29%), while the age group (< 1 year) was the smallest group (13%) [Fig. 1].

The governorates with the highest QCD rates are located in middle and eastern regions. Both regions had 21 cases (25%) [Fig. 2]. 13 (15%) cases were examined in May, while 6 (6%) cases were examined in the months of October and December [Fig. 3].

Forty-five (52%) of the QCDs occurred outdoors and 41 occurred indoors [Fig. 4]. Furthermore, the results showed that the main manner of the QCDs was accidental with 25 cases (29%), followed by homicidal and suicidal manners, with 22 cases (25%) and 11 cases (13%), respectively [Fig. 5]. In homicidal cases, the assailants were identified in 17 cases (77%): the child's parent in 8 cases (38%) and the child's relative in 4 cases (18%) [Fig. 6].

Wounds were named as the primary cause of death in 39 cases (45%), asphyxia was the cause in 19 cases (22%), natural death was the cause in 15 cases (19%), and substance toxicity was found in 1 case. Lacerated injury accounted for the death in 15 cases (39%) and fire-arm injury in 13 cases (33%). In asphyxia cases, hanging was identified in 12 cases (63%), followed by suffocation and drowning in 3 cases (16%) and 2 cases (11%), respectively [Table 2]. The manner of death in relation to its cause among the QCDs is illustrated in [Table 3]. The most frequently injured site was the head (alone or as part of multiple sites) in 23 cases (27%), followed by the neck in 18 cases (21%) [Table 4].

Upon examination of the QCDs, 5 (5.8%) cases showed signs of negligence. However, sexual abuse, natural death with signs of physical abuse, healed wounds and post mortem burn each had the frequency of 1 case (1%) [Table 5].

Table 1 Distribution of questionable child deaths according to their gender, nationality, identity and marital status

| Gender | Nationality | | | Marital status | Total |
|--------|-------------|-----------|------------|----------------|----------|
| | Saudi | Non-Saudi | | | |
| | | Arabic | Non-Arabic | | |
| Boy | 36(65%) | 12(22%) | 2(4%) | 5(9%) | 55(100%) |
| Girl | 16(50%) | 6(19%) | 4(12%) | 6(19%) | 32(100%) |
| Total | 52(60%) | 18(21%) | 6 (7%) | 11(12%) | 87(100%) |

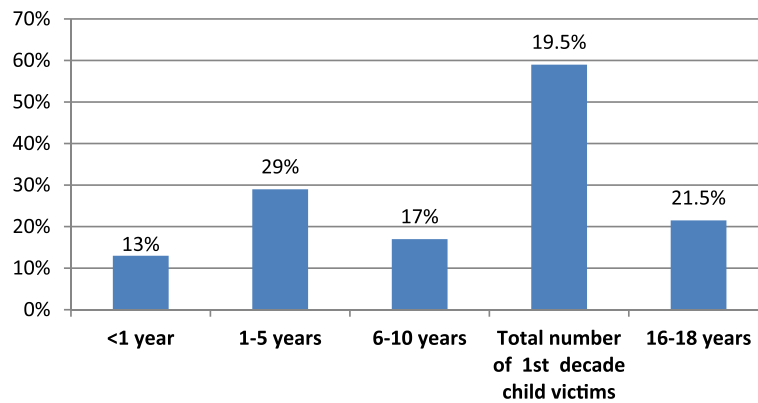


Fig. 1 Distribution of cases according to their age group

Discussion

Child fatality is the most tragic consequence of child maltreatment. The true incidence of fatal child injuries is unknown and requires multi-agency death review teams (Almuneef & Al-Eissa, 2011). The first reported case of child maltreatment in Saudi Arabia was in 1990, however, the case was not announced until 2004 (Heron & Betzaida, 2009).

This study clarified the patterns of QCDs due to unnatural intentional causes in the capital city of Kingdom of Saudi Arabia over 24 months. Data on the victims' age, sex, nationality, manner, and cause of death are analyzed.

In this study, the incidence of QCDs was higher in Saudi children, which is representative of the Saudi demographic majority (67.3%) in the country during 2014 (Saudi Arabia Monetary Agency (SAMA), 2014).

Moreover, the highest percentage of QCDs was of boys-5 years of age. This data concurred with similar studies of QCD data from Korea, Mexico, Portugal (UNICEF, 2003), Canada (J.p & Pearce, 2012), South Africa (Mortality and causes of death in South Africa, 2015), United States (Greenberg & López, 2014) and Europe (Sethi et al., 2013). The trend could be due to male children's curiosity,

which might lead them to wander off without supervision and lead to fatal consequences. Death by injury is much more common for boys than for girls (Mortality and causes of death in South Africa, 2015). This phenomenon could be explained either by boys taking more risks or by parents or schools being more permissive with boys than girls (UNICEF, 2003).

In the United States, 702,000 estimated child maltreatment deaths occurred in 2014, a rate of 9.4 victims per 1000 children. 27% of the victims were younger than 3 years, and there was a higher death rate in boys than girls (Greenberg & López, 2014).

In Europe, child maltreatment leads to the death of about or approximately 852 children under the age of 15 every year. Death rates in boys younger than 5 years account for 61% of European child maltreatment deaths (Sethi et al., 2013).

The highest QCD number was found in Riyadh's central and eastern governorates. These two regions were overcrowded and occupied by multinational, low socioeconomic class residents (Simple subject about Riyadh areas and their population, 2013). low socio-economic class communities had higher rate of non-accidental injury and child negligence deaths due to increased poverty, instability and unemployment (Groenewald et al, 2015)

In a 2015 statistical study done in South Africa, Western Cape (13,2%) and Gauteng (11,7%) had the highest proportion of questionable child deaths (Mortality and causes of death in South Africa, 2015) due to non-natural causes as higher proportion of natural child deaths occurring inside or outside hospitals were investigated at forensic mortuaries than in other regions.

Regarding seasonal variation, child injuries occurred mainly in spring and summer due to the increased outdoor activities; accordingly, such seasonal variation was detected in this study (Duncanson et al., 2009). Most of these QCD cases occurred outdoors. However, in Nebraska (Okoye, 2011), the majority of child homicides occur at

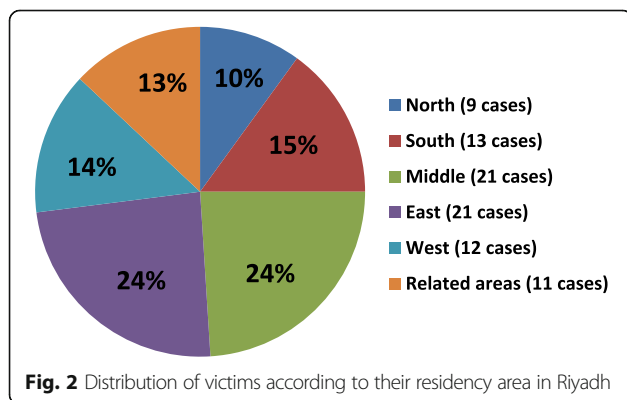


Fig. 2 Distribution of victims according to their residency area in Riyadh

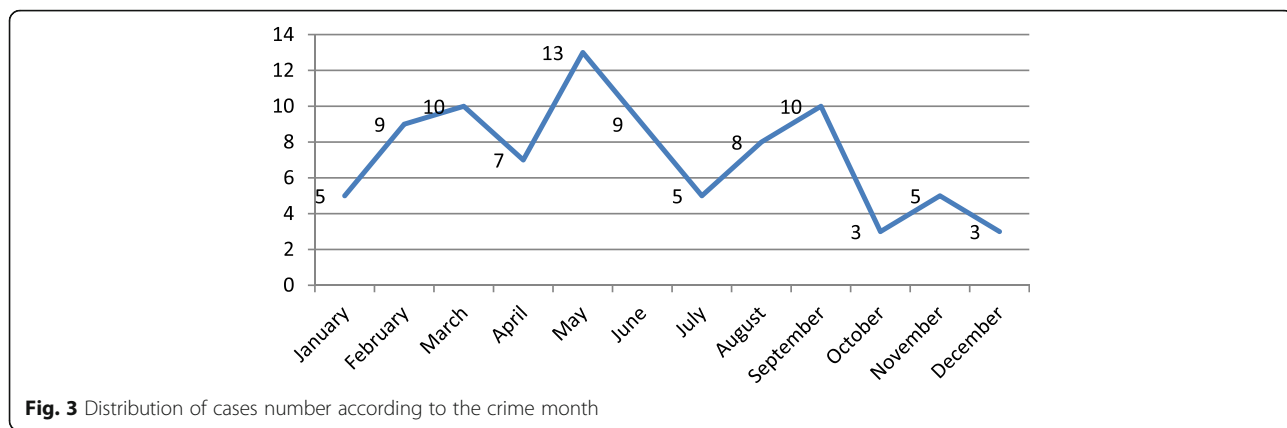


Fig. 3 Distribution of cases number according to the crime month

home with a family member perpetrator. Our finding was more so in line with Kim et al. (Kim et al., 2012), who stated that as victims’ ages increased, the rate of injury at home was less likely, whereas the likelihood of injuries outside the home (roads and playgrounds, and other facilities) increased.

These results suggest that the main manner of QCDs was accidental, followed by homicide and suicide. Al-mazrouh et al. stated that children, especially infants, were affected by accidents more often than children of other ages (Al-Mazrouh et al., 2008). Similarly, 2015 South African statistics reported that the majority of non-natural causes of death resulted from accidental injury (62.5%), followed by assault (14.1%) (Mortality and causes of death in South Africa, 2015).

In most cases, the identified perpetrators of victims were the child’s parents. This was in contrast to a study in Egypt in which the highest percentage of perpetrators were unknown (El-Elemia & Moustafa, 2013). However, our results were similar to studies in the United States (Riyadh Region, 2017), United Arab Emirates (Dajani, 2015) and Europe (Greenberg & López, 2014). These studies found that parents were to blame for 80% of QCDs as most of child homicides occur during parental quarrels due to impulsive reaction to an unresponsive child (Duncanson et al., 2009).

Concerning the cause of QCDs, wounds were most common, followed by asphyxia and natural death; poisoning was only detected in one case. Lacerations were the most common physical injury, followed by firearm injuries. In asphyxia cases, hanging was followed in frequency by suffocation and drowning. The most commonly injured site was the head, followed by the neck and chest. These results concurred with studies in Finland (Vanamo et al., 2001), Egypt (El-Elemia & Moustafa, 2013), and Australia (Schmertmann et al., 2012).

Similarly, a 2012 Korean study reported that traumatic head injuries was a serious type of physical abuse of boys 0–4 year of age (Kim et al., 2012). Major improvements in the ability to investigate and diagnose head trauma are needed, especially when a caregiver’s explanation does not match the severity of the injuries (Child abuse and negligence, 2013). In Europe, the most common cause of child deaths was asphyxia by suffocation, followed by injuries using sharp objects (Sethi et al., 2013).

Modifiable deaths, due to negligence or substandard child care, presented in more than 20% and 50% of unnatural child deaths in London (Department for Education (2013) Child death reviews, 2013) and the United States (Greenberg & López, 2014), respectively. However, this kind of death represent represent only 5.8% of all QCDs.

Reduction of child death rate needs long process of research, lobbying, legislation, environmental modification, public education, and significant improvements in accident

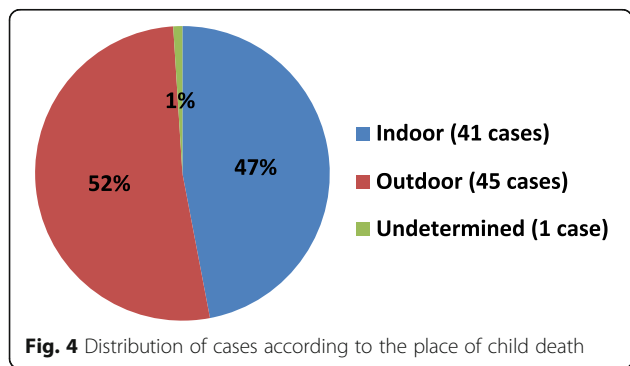


Fig. 4 Distribution of cases according to the place of child death

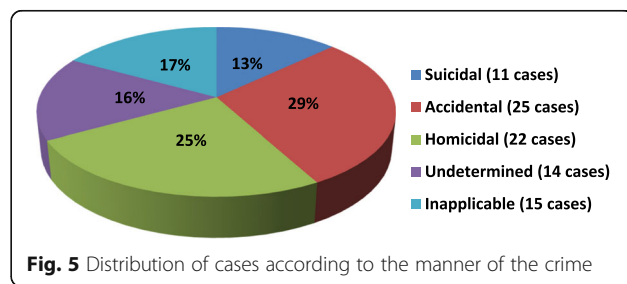
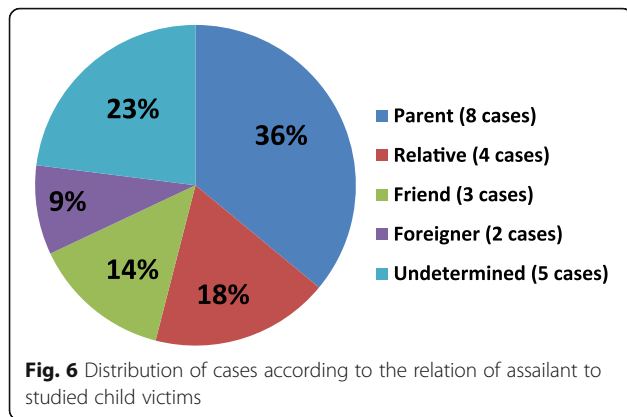


Fig. 5 Distribution of cases according to the manner of the crime



and emergency services in addition a better overlap between research findings, policy development and current practice in the interests of children at risk of abuse (UNICEF, 2003) (Duncanson et al., 2009).

Saudi Arabia has many child welfare practices (e.g. a hospital-based child protection teams project) approved by the Saudi National Health Council and National Family Safety program. Moreover, the Saudi ‘Shura’ Council (legislative parliament) reviewed the Optional Convention on the Rights of the Child (CRC) Protocols that respect Shari’ah law (Almuneef & Al-Eissa, 2011); however, the Council has not yet reported to the CRC Committee on the implementation of these protocols (OHCHR, 2006).

Table 2 Causes of death’ distribution among studied child victims

| Causes of death | Type | No.(%) |
|---------------------------------|----------------------------------|-------------|
| Wound | Firearm wound | 13 (33%) |
| | Traumata due to fall from height | 3 (8%) |
| | Lacerated wound | 15 (39%) |
| | Cut wound | 4 (10%) |
| | Stab wound | 4 (10%) |
| | Total | 39 (100%) |
| | Asphyxia | Suffocation |
| Throttling | | 1 (5%) |
| Strangulation | | 1 (5%) |
| Hanging | | 12 (63%) |
| Drowning | | 2 (11%) |
| Total | | 19 (100%) |
| Toxicology | Carbon monoxide | 1 (100%) |
| Electricity | | 1 (100%) |
| Natural death | | 15 (17%) |
| Omission acts/Negligence | | 5 (6%) |
| Undetermined cause ^a | | 7 (8%) |
| Grand total | | 87 (100%) |

^aThis term is used when the cause of death cannot be established

Table 3 Distribution of the manner in relation to cause of death among studied child victims

| Manner | Cause of death | Type | No (%) |
|---------------------------|----------------|---------------|-----------|
| Suicidal | Wound | Firearm | 2 (8%) |
| | Asphyxia | Hanging | 9 (82%) |
| | Total | | 11 (100%) |
| Homicidal | Asphyxia | Suffocation | 1 (4.5%) |
| | | Throttling | 1 (4.5%) |
| | Wound | Firearm | 3 (13.6%) |
| | | Contused | 8 (36.4%) |
| | | Sharp | 8 (36.4%) |
| | Omission | | 1 (4.5%) |
| | Total | | 22 (100%) |
| Accidental | Asphyxia | Hanging | 2 (8%) |
| | | Suffocation | 1 (4%) |
| | | Strangulation | 1 (4%) |
| | | Drowning | 2 (8%) |
| | Wound | Firearm | 6 (24%) |
| | | Contused | 9 (36%) |
| | Omission | | 2 (8%) |
| | Poisoning | | 1 (4%) |
| | Electricity | | 1 (4%) |
| | Total | | 25 (100%) |
| Undetermined ^a | Asphyxia | Suffocation | 1 (7%) |
| | | Hanging | 1 (7%) |
| | Wound | Firearm | 2 (13%) |
| | | Contused | 1 (7%) |
| | Omission | | 2 (13%) |
| | -ve autopsy | | 7 (50%) |
| Total | | 14 (100%) | |

^aThis term is used when information pointing to one manner of death is no more compelling than one or more than one competing manners of death in through consideration of all available information

Table 4 Distribution of the injured site in the body

| Injury site | No.(%) |
|---|-----------|
| Head | 12 (14%) |
| Neck | 18 (21%) |
| Chest | 12 (14%) |
| Abdomen | 2 (2%) |
| Extremities | 2 (2%) |
| Back | 1 (1%) |
| Multiple sites including head | 11 (13%) |
| Undetermined or inapplicable ^a | 29 (33%) |
| Total | 87 (100%) |

^aThis term is used when determination of injury’s site is difficult e.g. natural death, toxicology, etc

Table 5 Child cases showing other signs on examination

| Other signs with examination | No (%) |
|--|--------|
| Signs of sexual abuse | 1(1%) |
| Natural death with signs of physical abuse | 1(1%) |
| Healed wounds | 1(1%) |
| Postmortem burn | 1(1%) |
| Omission acts/Negligence | 5(6%) |
| Total | 9(10%) |

Conclusion and recommendation

This study analyzed the epidemiology of child fatalities referred to the Riyadh Forensic Medicine Center for medico-legal investigation. The key group was boys aged 1–4 year old. More child deaths occurred in spring and summer. Despite a significant trend of accidental deaths, wounds due to blunt objects and firearm weapons were also prevalent among the studied cases. The strength of this study lies in the fact that it is the first retrospective work in the field of childhood questionable deaths in Riyadh, the capital of Kingdom of Saudi Arabia. The limitations of the data result in this one center-based study. The included subjects represent only the children who were referred to the Forensic Center for medico-legal investigation due to suspicious circumstances. However, these basic data do reveal the aforementioned at-risk groups and most prevalent injury types. This initial study highlights the need for additional population-based research, resources, and subject training for better data collection, assessment of the problem's magnitude, and the dissemination of information to politicians, the press, and the public through prevention and education campaigns. Moreover, Child Death Review Team Programs should include participants from various child health and safety disciplines (Jenny & Isaac, 2006); such teams are urgently needed to detect fatal child abuse cases that could be misclassified as natural or unintentional deaths. All of these efforts should, of course, be supported backed by significant governmental commitment.

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Availability of data and materials

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Authors' contributions

SFI (research idea, plan, statistical part, writing and revision of manuscript); AA and MM (research plan, data collection, revision of manuscript); NA and AQ (writing and revision of manuscript). All authors read and approved the final manuscript.

Ethics approval and consent to participate

The research protocol was approved by the ethical committee of Princess Nourah Bint Abdulrahman university, Riyadh, Saudi Arabia, its reference number is (17–0178). Consent to participate was waived by the Riyadh Forensic Medicine Center as there was no contact with victims or their families.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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