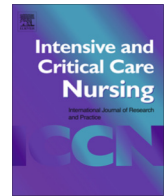




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## Review Article

## The impact of visiting the Intensive Care Unit (ICU) on children's and adolescents' psychological well-being: A systematic review

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## ABSTRACT

**Objectives:** The visits of children/adolescents in adult intensive care units are increasingly more common. However, few studies examine the psychological impact of visiting. This systematic review aims to summarise the psychological effects that visiting family members has on children/adolescents.

**Research methodology:** A systematic review of research articles published from 1990 to January 2021 was conducted using PsycInfo, PubMed, and CINAHL. Inclusion/exclusion criteria were applied. Those studies included were evaluated using the Joanna Briggs Institute Critical Appraisal tools. A narrative synthesis of the results was conducted.

**Setting:** Adult intensive care unit.

**Results:** The review identified five studies (three of which qualitative), involving 141 children/adolescents. Although the experience of visiting was potentially traumatic, it enabled children/adolescents to better understand the reality and to preserve their relationships with family members. The impact of visiting was influenced by individual characteristics (e.g., age, past traumatic experiences) and by organisational characteristics (e.g., facilitated visit or not). Regardless of visitation, most children/adolescents presented anxiety and depression symptoms that need to be addressed.

**Conclusions:** Child/adolescent visitation seems to have positive effects, provided there is preparation and facilitation. Clinicians should pay attention to individual characteristics and optimise organisational factors (e.g., environment) in order to minimise potentially trauma-inducing aspects.

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## Implications for clinical practice

- Visitation provided children/adolescents a possibility to better understand the reality and to preserve their deep bond with their family member.
- Visitation was a potentially traumatic experience for some children/adolescents due to the visual and auditory stimuli linked to the environment and the patient's appearance.
- Educational interventions should be promoted to prepare and support children/adolescents' visitation to the intensive care unit
- Nurses and other staff members can mitigate the traumatic aspects of visitation by explaining the units function, preparing youngsters for the environment and the patient's appearance, facilitating caregiving opportunities and insuring privacy and intimate moments.

## Introduction

Hospitalisation in the Intensive Care Unit (ICU) is an event that can generate stress, anxiety, and depression in family members

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(Pochard et al., 2005). Preserving relationships with loved ones, hospitalised in the ICU, is paramount for family members (Curley et al., 2020; Lamiani et al., 2020; Norris and Grove, 1986). However, this fundamental need is often denied by restrictive visiting policies that linger in some countries (Lamiani et al., 2013). Historical concerns were that unrestricted visitation could interfere with care, increase infections, or cause additional stress for patients and staff (Berti et al., 2007). Recent studies report that unrestricted visiting policies are not associated with increased risk of infections (Burchardi, 2002; Malacarne et al., 2011, 2008). On the contrary, flexible visitation is associated with improvements in patient health outcomes, such as reductions in cardiovascular complications, anxiety, hormonal markers of stress and sleep problems (Fumagalli et al., 2006; Junior et al., 2018). Reduced stress and anxiety, and increased satisfaction have also been reported among family members (Garrouste-Orgeas et al., 2008; Junior et al., 2018; Rosa et al., 2019). For these reasons, over the last decade, implementation of unrestricted visitation policies and the removal of physical and relational barriers between patients and families have been advanced in the ICU (Berwick and Kotagal, 2004).

Due to the introduction of family-centred practices and more permissive policies, the presence of children and adolescents in the adult ICU has become commonplace. Supportive interventions and educational materials have been described in the literature to facilitate children/adolescents' visitation to their relatives in the ICU (Clarke and Harrison, 2001; Davis, 2015; Hanley and Piazza, 2012). However, concerns and vestiges of resistance towards youngsters' visitation still remain (Garrouste-Orgeas et al., 2016; Knutsson et al., 2004). Common fears reported by parents and ICU clinicians include causing additional stress in children, increasing infections and not being prepared to manage the logistical and psychological aspects of the visit (Maxwell et al., 2007; Marco et al., 2006; Meyer et al., 1996; Vint, 2005; Ward et al., 1994). However, contributions from attachment theory (Bowlby 1969) and the understanding of grief as it relates to children (Child bereavement UK, 2020), emphasise the importance for children to maintain the bond with attachment figures during critical illnesses. Indeed, for children and adolescents of ICU patients, the prolonged separation imposed by restrictive visiting policies may increase separation anxiety, generate negative and distressing fantasies about the patient's health, and lead to a feeling of exclusion, isolation and complicated grief (Clarke and Harrison, 2001; Kean, 2010a).

To date, no systematic review has attempted to summarise the effects that visitation has on children/adolescents' psychological well-being and to identify what factors of the visitation experience may contribute to it. Only recently, a published letter to the editor of Intensive Care Medicine highlighted the psychological benefits and risks of allowing children to visit the ICU (Laurent et al., 2019). In order to address this gap, we conducted a systematic review of research studies with the aim to address the following questions: "What is the psychological impact for children/adolescents of visiting their family members in adult ICU?" and "What particular factors of the visiting experience are associated with children/adolescents' psychological well-being?". Reviewing available evidence is of pivotal importance in order to advance clinical practice and develop evidence-based guidelines.

## Material and methods

A systematic review was undertaken in order to summarise the main findings available on the psychological effects of children/adolescents' visits in the ICU. A systematic review aims to provide a comprehensive and unbiased synthesis of available evidence that is relevant to a particular question, using rigorous and transparent methods (Lockwood et al., 2017).

## Search strategy

The review protocol was registered in PROSPERO (reference number CRD42020164189). A preliminary literature search was conducted by the second author (FB) in order to become familiarised with the literature on the topic of child/adolescent visitation in ICU and to assess publication trends. Based on this preliminary search, we limited the search to English-language articles published from 1990 to 2021 as most of the articles on the topic were published during this timeframe. The search was conducted the 15th of January 2021 using PubMed, PsycInfo and CINAHL, which are considered the main academic databases for health and psychological sciences. The search included a combination of the following MeSH terms: "child", "adolescent", "visitors to patients", "Intensive Care Units", "psychological well-being", "mental health", "psychological adaptation", "psychological trauma", "depression" and "emotion". A librarian was consulted to ensure that the search terms were satisfactory to produce a specific enough search strategy.

## Inclusion/exclusion criteria

We included quantitative and qualitative studies focusing on children/adolescents' psychological well-being after visiting their family members in adult ICUs. We included studies involving children and adolescents up to 17 years of age, who had a close family member (e.g., parent, grandparent, or sibling) hospitalised in the adult ICU. If studies included a greater upper age range and it was not possible to separate the findings of those over 18 years old from those of minors, determinations about inclusion/exclusion were based on discussion among authors. We excluded non-empirical studies (e.g., review articles or commentaries), studies on parents' or healthcare professionals' attitudes about children/adolescents' visitation, and studies which solely described the development of interventions to facilitate children's visitation, such as booklets or educational programs. Studies with non-retrievable abstracts or full texts were excluded.

## Data extraction

Excel was used to manage the retrieved literature. Duplicates were removed and titles and abstracts were screened by two reviewers (FB, GL), who applied inclusionary and exclusionary criteria. When the abstract was not sufficient to determine study eligibility, full text versions were obtained.

For the eligible studies, the following data were extracted: authors, year of publication, country of origin, population, research design, method of data collection, time of data collection, type of intervention (e.g., nature of visit and how conducted), and impact of the visit on children/adolescents. References of the eligible studies were also examined to verify whether there were additional studies that might have also been eligible for the review.

## Quality assessment

The Critical Appraisal Tools for qualitative and quantitative studies (Lockwood et al., 2017) developed by the Joanna Briggs Institute (JBI) were independently applied by two reviewers (FB, GL). Studies were included in the review if 6 out of 9 items (for quantitative research) or 7 out of 10 items (for qualitative research) were scored as "Yes." Disagreements related to quality assessment were resolved through discussion with a third reviewer (SD).

### Data analysis

Given the variability of the research designs and outcomes, a narrative synthesis of the studies was conducted (Popay et al., 2006). In the narrative synthesis, we attempted to synthesise the findings of the different studies by identifying collating concepts, searching for common meanings, and exploring relationships between studies results. As such, the narrative synthesis followed an interpretative inductive process, which began with the data in order to generate themes (Popay et al., 2006). Specifically, qualitative and quantitative data were combined, by using the convergent integrated method, introduced by the JBI. The data of quantitative studies were extracted and converted into textual descriptions in order to allow the integration with qualitative data (Lockwood et al., 2017). The findings of the eligible studies were then analysed inductively by two reviewers (FB, GL), who independently read the results of the articles applying a line-by-line coding in order to identify the categories that could describe the meaning and content of the research findings. Then, categories were clustered in order to develop descriptive themes. Finally, during face-to-face meetings, the same two reviewers discussed the descriptive themes and agreement was reached on the themes' content and labelling.

### Results

A total of 498 articles were retrieved from the aforementioned databases. We excluded 145 duplicates. Of the remaining 353 articles, 348 were excluded for the following reasons: did not involve children/adolescents ( $n = 168$ ); not located in adult ICU settings ( $n = 112$ ); no abstract or full-text available ( $n = 28$ ); were non-empirical studies ( $n = 24$ ); or did not focus on children's psychological well-being ( $n = 16$ ). A total of 5 eligible articles were assessed for quality. No additional studies were identified by checking the references of the included studies. None of the eligible studies was excluded based on the JBI Critical Appraisal Tools, therefore, all 5 articles were included in the review. The review process is summarised in Fig. 1.

#### Study characteristics

The characteristics of the five studies included in the review are reported in Table 1. Studies employed both qualitative ( $n = 3$ ) and quantitative designs ( $n = 2$ ). Four of the five studies were conducted in Europe. The sample size ranged from 12 to 53 children/adolescents and the age ranged from 4 to 17 years old. One study (Kean, 2010b) included also young adults up to 25 years old, in addition to children. Quantitative studies collected outcome measures within 15 days from visitation, whereas qualitative studies collected outcome measures from 2 weeks to 3 months following visitation. All studies were conducted in adult ICUs and the visiting experiences in three of the five studies were conducted with either no preparation or no systematic preparation.

#### Quality assessment

All studies met 2/3 or more of the JBI quality criteria (Lockwood et al., 2017). However, only one study (Knutsson et al., 2007) met 9 out of 10 criteria. A quasi-experimental study (Nicholson et al., 1993) had a small sample size ( $n = 20$ ), no power analysis was conducted, and lacked a pre-intervention measurement of the outcomes, thus weakening its internal validity. An observational study (Fergé et al., 2018) presented a low response rate (55%) and did not report the power analysis. None of the qualitative studies (Kean, 2010b; Knutsson and Bergbom, 2016; Knutsson et al.,

2007) addressed the potential influence of the researcher on the research, and vice versa. Some studies were judged not to draw clear connections between the research methodology and data analysis (Kean, 2010b; Knutsson and Bergbom, 2016).

#### Narrative synthesis

The narrative synthesis yielded four themes that describe the effects of visitation on children/adolescents. The experience of visitation was: 1) Potentially traumatic; 2) Facilitated the understanding of reality; 3) Helped to preserve relationship; and 4) Influenced by individual and organizational factors.

##### Visitation was potentially traumatic

In three studies (Kean, 2010b; Knutsson and Bergbom, 2016; Knutsson et al., 2007), some children/adolescents described visitation as a traumatic and dreadful experience, especially if it was the first visit and if the visit was not facilitated. Some children reported high levels of stress, shock, fear, and emotional "paralysis" (Knutsson and Bergbom, 2016) when entering into their family member's hospital room. Nicholson et al. (1993) found that children visiting their relatives reported higher post-traumatic stress symptoms than children who did not visit.

The traumatic experience was often linked to sensory aspects of the visitation experience, such as the smell of the patient and the sight or sounds associated with the hospital. Some children/adolescents were negatively impressed by the white, impersonal "gloomy" (Knutsson et al., 2007) lack of color of the ICU environment including bright lights and white sheets. Others, especially young children, were frightened at the sight of the wires and sounds that characterise the ICU equipment and environment (Kean, 2010b; Knutsson et al., 2007). Many vividly remembered their relatives' swollen hands, coated tongue, tubes, different skin color, and their unresponsiveness. One child described her parent as a "dead weight" (Kean, 2010b; Knutsson and Bergbom, 2016). These details lead to the common shocking experience of seeing their family members as "strange", as if they were not the "real" self (Kean, 2010b; Knutsson et al., 2007). For some children/adolescents the experience of visiting was followed by feelings of powerlessness, helplessness, strangeness, and concern (Knutsson and Bergbom, 2016).

##### Visitation facilitated the understanding of reality

Despite being a potentially traumatic encounter, the visitation was described as an opportunity to see with their "own eyes" and therefore to acquire direct, unfiltered information about the relative's condition thus contributing to a more realistic appraisal of the situation (Kean, 2010b; Knutsson and Bergbom, 2016). However, when the child/adolescent was not prepared prior to visitation or visitation was not facilitated, in some cases, distressing misunderstandings emerged regarding the purpose and function of the ICU equipment (Kean, 2010b).

For children and adolescents, seeing with their own eyes helped to bridge the gap between reality and imagination. For some, visitation was a soothing and reassuring experience, because the reality of the situation was not perceived as badly as they had imagined (Knutsson and Bergbom, 2016; Knutsson et al., 2007). Importantly, interactions with the ICU staff contributed to the children/adolescents' perception that their family member was safe and well taken care of (Kean, 2010b). For others, especially adolescents, visitation helped to concretise the seriousness of the relative's clinical situation (Kean, 2010b; Knutsson and Bergbom, 2016; Knutsson et al., 2007) and create meaning about what was happening (Kean, 2010b). By promoting a greater understanding of the reality, the visiting experience generated a wide range of feelings, from hope and consolation, to despair and concerns about the

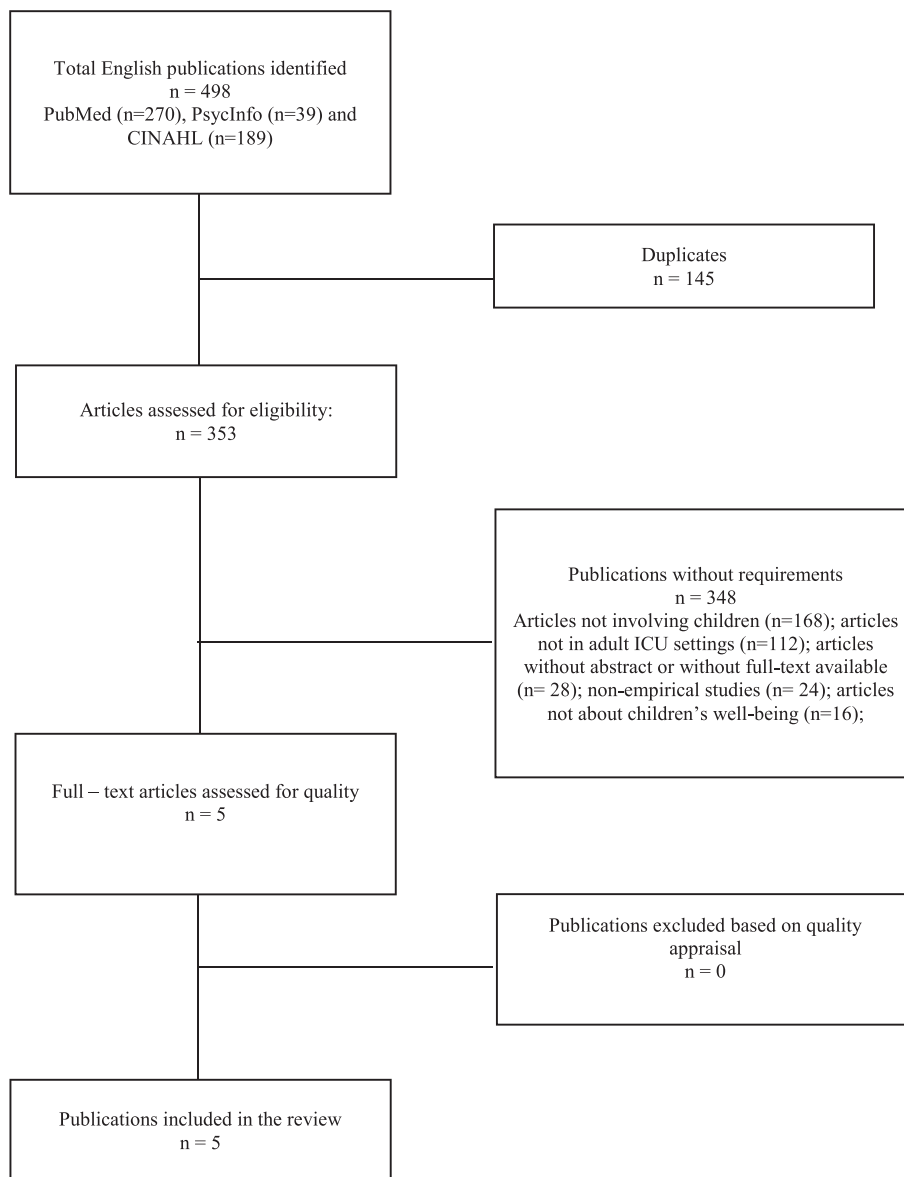


Fig. 1. Flow diagram of the review process.

future, including possible death (Kean, 2010b; Knutsson and Bergbom, 2016). Importantly, however, in both quantitative studies (Fergé et al., 2018; Nicholson et al., 1993) those children/adolescents who visited did not report higher anxiety or depressive symptomatology than non-visiting children/adolescents.

#### Visitation helped to preserve relationship

Most children and adolescents considered visitation as an opportunity to reconnect with the family member, to maintain their relationship (Knutsson et al., 2007) and repair the sense of separation and loss. ICU hospitalisation was clearly a distressing experience for them. They reported that something was “missing” and wanted their family member to come home and be able to restart their “ordinary life” again (Knutsson and Bergbom, 2016). Visitation was an opportunity to see that the relative was still alive (Knutsson and Bergbom, 2016) and to rekindle that deep bond and relationship by physically seeing each other and being together (Knutsson et al., 2007). For some children/adolescents, visitation was a means to demonstrate their love for their family member and to restore a sense of continuity with the past (Knutsson and

Bergbom, 2016). Many expressed the need to be physically close, to touch and kiss their family member, and share with them everyday conversations (Knutsson et al., 2007). The chance to see and stay with the family member was associated with positive emotions of hope, joy, calm, happiness and relief (Knutsson and Bergbom, 2016; Knutsson et al., 2007).

When visitation was facilitated, some children were invited to engage in the care process for their loved one, such as using a stethoscope or applying lotion as a gesture of care. Some children/adolescents were also encouraged to draw or write down observational notes about the visiting time with their family member (Kean, 2010b). Under these circumstances, the chance to reconnect with the family member reduced the sense of powerlessness and exclusion (Knutsson et al., 2007). However, in another study where visitation was not facilitated (Knutsson and Bergbom, 2016), some children reported being afraid of touching their family members or harming them and the children/adolescents stood at distance, uncertain as to what to do.

Some children/adolescents expressed frustration when visits were interrupted and it was not always possible to maintain inti-

**Table 1**  
Characteristics of included studies.

Author (year); Country	Population	Relatives visited	Intervention	Study design	Data collection method	Positive impact	Negative impact
Nicholson et al. (1993); USA	20 children (5–17 yr)	Parents and grandparents	Visit in ICU with information meeting before the visit. Support during and after the visit by RN	Quantitative study Experimental group (10 children) and Control Group (10 children)	Life of Event Scale, Manifest Anxiety Scale, Child Perceived Change Scale. Time: after the visit (48 h)	* Reduction in negative behaviours and emotions in the experimental group (Child Perceived Change Scale) ( $t = 4.0$ ; $p \leq 0.001$ )	* Increased life event changes in the experimental group (Life of Event Scale) ( $t = -2.1$ ; $p \leq 0.05$ )
Knutsson et al. (2007); Sweden	28 children (4–17 yr)	Parents, grandparents and siblings	Visit in ICU without information meeting before	Qualitative study	Semi-structured individual interview. Time: after the visit (2.5 weeks to 3 months)	* Opportunity to be present and be connected * Sense of relief and happiness * Curiosity	* Fear of ICU environment * Waiting increased the feeling of uncertainty, stress and separation
Kean (2010a), Kean (2010b); UK	12 parents, 5 children (8–13), 7 adolescents (14–25 yr)	Parents and siblings	Visit in ICU with occasional information meeting before	Qualitative study	Semi-structured family interview. Time: after the visit (no specific time)	* Greater comprehension of ICU environment * Possibility to obtain information and construct meaning of the critical illness	* Feeling shocked and scared at the first visit * Misunderstandings about medical equipment function
Knutsson and Bergbom (2016); Sweden	28 children (4–17 yr)	Parents, grandparents and siblings	Visit in ICU without information meeting before	Qualitative study	Semi-structured individual interview. Time: after the visit (2.5 weeks to 3 months)	* Opportunity to be present and be connected * Feeling involved * Feeling relieved and proud	* Powerlessness * “Creepy” feeling
Fergé et al. (2018); France	53 adolescents (12–17 yr)	First- to third-degree relatives in regular contact (minimum once a month)	Visit in the ICU with information meeting before. Support during the visit by MD	Quantitative study Experimental group (40 adolescents) and Control group (13 adolescents)	Hospital Anxiety and Depression Scale, Anxiety History Questionnaire and Satisfaction Survey. Time: after the visit, (any time before the patient's extubation and before the 15th day of hospitalisation)	* Lower regret in visiting adolescents as compared with non-visiting adolescents ( $p \leq 0.001$ ) * No significant difference in anxiety and depression according to visiting status	–

macy because of clinicians' need to intervene and the ICU's naturally intrusive environment (Knutsson and Bergbom, 2016). Furthermore, some children reported that waiting before being admitted to the ICU increased their tension and worries (Knutsson and Bergbom, 2016; Knutsson et al., 2007). Despite these issues, visiting was generally described as a source of pride for having “dared” to visit and relief for having seen their family member (Knutsson and Bergbom, 2016). Among adolescents, Fergé et al (2018) observed that the sense of regret was lower amongst visiting adolescents than those who did not visit.

#### Visitation influenced by individual and organisational factors

The effects of visitation were influenced by individual and organisational factors. Concerning individual factors, Kean (2010b) found that visitation seemed potentially more distressing for adolescents because they could better understand the function of the ICU equipment and, therefore, could make inferences about the seriousness and potentially life-threatening nature of the illnesses that had befallen their family members. Fergé et al (2018) reported that first-degree relationship with the patient, past exposure to a traumatic event, and past sense of threat were signifi-

cantly associated with anxiety and depressive symptomatology among adolescents, regardless of whether they visited the ICU or not.

Regarding organisational factors, most of the studies reporting negative outcomes from visitation (Kean, 2010b; Knutsson and Bergbom, 2016; Knutsson et al., 2007) were those in which the children/adolescents were not routinely prepared beforehand or received only occasional information prior to meeting. By contrast, other studies (Fergé et al., 2018; Nicholson et al., 1993) reported that preparing children/adolescents beforehand and supporting them during the visitation seemed to prevent misunderstandings, facilitate the child-family member connection, and decrease negative behavioural and emotional responses.

## Discussion

This review aimed to summarise the effects of adult ICU visitation on the psychological well-being of children/adolescents. Despite the limited number of studies and their predominantly qualitative nature, the review identified several benefits and some challenges of the visitation experience.

Concerning the challenges, evidence from these studies suggests that visitation could potentially be a traumatic experience for children/adolescents, especially if there is not adequate preparation or facilitation. Potentially traumatic effects of the visitation seemed to be related to the visual-sensory aspects of the visit. Some children/adolescents were shocked at the sight of their family member with sores and wounds and reported repugnance at the patient's sight or smell (Kean, 2010b; Knutsson and Bergbom, 2016). Other were frightened by life-sustaining equipment, such as ventilators and tubes (Kean, 2010b). The ICU appeared a "white", unfamiliar, and unwelcoming environment (Knutsson et al., 2007). To minimise the traumatic aspects of the visitation, attention should be paid to adequately prepare the environment and the patient's appearance by using, for example, coloured sheets or by covering tubes and probes. Findings of this review highlight that the impact of the visitation depends largely on its preparation and facilitation (Fergé et al., 2018; Kean, 2010b). However, preparation and support during visitation were variable, and not always guaranteed. It is important that children/adolescents are prepared and accompanied during visitation by trained clinicians or psychosocial staff, who can guide them, explain the function of potentially intimidating equipment, and answer questions in order to mitigate fears and avoid misunderstandings (Hanley and Piazza, 2012; Kean, 2010a). Clinicians are urged to tailor their preparatory activities to a given child's developmental level, previous experiences, and the family situation (Clarke and Harrison, 2001; Hanley and Piazza, 2012).

Despite its potential negative aspects, findings also suggest that visitation often had positive effects for children/adolescents. First, visitation seems to facilitate the understanding of reality. Physically seeing their family member helped children/adolescents to come to terms with the difficult realities and start to comprehend the situation (Knutsson and Bergbom, 2016). Parents frequently control information about the family member's illness to protect their children/adolescents, who, consequently, can feel excluded or can construct their own beliefs using imagination (Kean, 2010a). On the contrary, seeing with their own eyes allowed youngsters to bridge the gap between reality and imagination, and provided an accurate first-hand source of information (Hanley and Piazza, 2012). Greater understanding of the situation can lead children/adolescents to experience difficult emotions, such as sadness, despair, and worry. Yet, these emotions are congruent with their challenging lived experiences (Knutsson and Bergbom, 2016) and may reflect the grief process, which is characterised by a mixture of difficult emotions in response to the relative's suffering and/or dying (Heath et al., 2008). Despite the possible presence of difficult emotions associated with visitation, findings of this review highlight that children/adolescents who visited did not report higher anxiety or depressive symptomatology, but rather presented a reduction of negative behaviours (Nicholson et al., 1993) and a diminished sense of regret (Fergé et al., 2018).

Another potential benefit of visitation was the ability to preserve the child-relative bond. Through visiting, children/adolescents seemed to realise that their relative was still alive, thus mitigating separation anxiety and rekindling their relationship. The encounter permitted youngsters to spend time together and to demonstrate that they care (Knutsson et al., 2007). After the visitation, joy and calm replaced the feelings of uncertainty and loss (Knutsson and Bergbom, 2016; Knutsson et al., 2007). These results are consistent with attachment theory (Bowlby, 1969), which emphasises that children need to maintain the physical proximity with their attachment figures, especially in the presence of physical or psychological threat, such as illness. Proximity to the attachment figures is a source of psychological security and well-being (Bowlby, 1969). Recent literature on attachment theory provides

evidence of family attachment relationships that go beyond the "mother-child" relationship to also include fathers, grandparents, and siblings (Cassibba, 2003; Lamb, 2005; Whiteman et al., 2011). For this reason, child/adolescent visitation should be promoted based on the significance of the relationship with the ICU patient, regardless of the patient's particular role. When visiting, some children expressed the need for additional privacy to get physically close to their family members and talk to them about what is happening in their lives (Knutsson and Bergbom, 2016). Therefore, if possible, attention should be paid to respect the intimate space of the child-family member relationship and to avoid unnecessary intrusions.

Finally, our review highlighted how the critical illness of a family member can have negative effects on children/adolescents (Appleyard et al., 2000). Regardless of visitation, nearly 54% of adolescents with a family member in the ICU reported anxiety and depression symptomatology (Fergé et al., 2018). This result calls for greater attention to the psychological needs of children and adolescents in order to help them cope with the challenging situation of having a critically ill family member hospitalised in the ICU.

### Limitations

The number of available studies on the effects of children/adolescents visitation in adult ICUs is limited. Further, several of the studies had small sample sizes and were qualitative in nature. For these reasons, the results may not be generalizable and the conclusions, based on a narrative synthesis, are provisional. Qualitative studies have the merit of raising the attention to the topic and exploring the inner lived experience of children and adolescents who visit their family members in the ICU. Moving forward, quantitative studies should also be conducted to assess the impact of visiting on psychological well-being. In addition, the impact of facilitated visits could be compared to non-facilitated visits in order to better understand what particular interventions work and what does not, in order to guide and improve practice. The literature search was limited to the three main databases for health sciences. Therefore, relevant studies published in other databases may not have been retrieved. Furthermore, we limited the studies to children/adolescent 17 years of age or younger, but one qualitative study included adolescents/young adults up to age 25, and it was not possible to separate the findings of those over 18 years old from those of minors. Further, the inclusion of only English-language articles may have introduced a selection bias.

### Conclusions

Evidence from this review suggests that visitation by children/adolescents into adult ICUs has several benefits and some challenges. Visitation provides children/adolescents a possibility to better understand the reality and to preserve their relationships with their family members. However, visiting was a potentially traumatic experience for some children due to the visual and sensory stimuli. The findings of this review can serve to develop evidence-based strategies to minimise the negative effects of visitation through adequate preparation and facilitation. Importantly, clinicians can mitigate the traumatic aspects of visitation by incorporating strategies such as explaining the ICU's functions, preparing youngsters for the environment and the patient's appearance, facilitating caregiving opportunities and insuring privacy and intimate moments. At the same time, by identifying the precious cognitive and relational functions that visitation can hold for children/adolescents, the review may spur clinicians to develop creative ways to maintain the child-patient connection during critical care hospitalisation and at time of separation.

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## Conflict of interest

None.

## Author's contributions

GL and FB wrote the review protocol. FB conducted the literature search. GL, FB and SDN reviewed the studies for eligibility and performed the quality assessment. GL, FB performed the narrative synthesis and wrote the first draft of the study. GL, FB, SDN and ECM critically revised the manuscript and approved the final version.

## Ethical statement

Institutional review board approval was not required because all the data were retrieved from public databases.

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## Clinical Trial registration number

Non Applicable.

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