

## COMICS AS AN EDUCATIONAL TOOL FOR CHILDREN UNDERGOING SURGERY: LITERATURE REVIEW

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### Abstract

*Children undergoing surgery become more vulnerable to their needs; particularly the psychological needs, becoming more susceptible to an emotional imbalance, anguish, fear, which often translates into anxiety and depression. Anxiety needs to be overcome by providing appropriate intervention, one of these is by providing education. Being informed and having an accurate expectation through preparatory information produce cognitive control that decreases the deleterious impact of the imminent stressors. This literature aimed to present an overview summary of comics as a promising educational tool through study the impact of preoperative education using comics on surgery-related children's information and their preoperative anxiety level. Comics and graphic novels as educational learning tools is still a fairly new field of research. Comical storytelling narrative may be an innovative and interactive educational tool in today's media-rich environment.*

**Keywords:** Children undergoing surgery; Comics; Educational tool; Preoperative anxiety.

### Introduction

Surgeries, especially for children, is not an easy challenge, regardless of the condition and the disease being treated, negative stress factors present (Wilcox, 2018). The preoperative period is a stressful disruptive traumatic event that triggers a child's cognitive, physiological, and emotional responses (Ghimire & Poudel, 2018). Cognitive performance and active participation may be affected by anxiety, thereby altering the outcome of the surgical operation (Ruis, Wajer, Robe, & Van Zandvoort, 2017). Extreme preoperative anxiety can cause delirium emergence, which can lead to self-injury, surgical dressing removal, and likely exacerbate the postoperative effects (Hashimoto et al., 2020).

Via many cognitive and behavioral responses, negative symptoms due to preoperative fear may be

externalized, which may have negative implications in the short, medium, and long term. Negative effects, including treatment resistance, diminished compliance, and avoidance of contact with healthcare providers, may differ in the manner they are manifested. It also leads to a weak reaction to medical services or raises the need for medication by extended hospital visits or further outpatient service (Arriaga & Pacheco, 2016).

Pharmacological treatment of preoperative anxiety tends to be effective and favored by anaesthesia providers. However, pharmacological anxiety management interventions are typically associated with higher hospital stay rates, possible surgical delay, and delayed rehabilitation (Bizzio et al., 2020). Although the systemic use of

pharmacological interventions remains problematic, numerous non-pharmacological approaches such as preoperative psychological preparation, and preanesthetic parental presence have been proposed to reduce children's preoperative anxiety. Distraction is also increasingly considered, as it can be used in many ways such as clowning, music, play therapy, teddy bear, cartoons, and animation video games (Sola et al., 2017).

Health educational comics grows popularly and have a variety of uses, including raising awareness of illness symptoms; educating children for what to expect from a surgical operation, for example; helping with decision-making, such as choosing between care options; generally improving knowledge and acceptance of a condition (McNicol, 2017). Research has shown effectiveness of using narratives to talk about concepts of health and that it can be helpful to communicate complex knowledge using visual narrative communications components. Fields such as medical education and public health have begun to explore the convergence of narratives and simulation in a more structured manner in order to inform about the health. The use of sequential visual storytelling to communicate health-related experiences and knowledge is discussed in Graphic Medicine. Graphic medicine is the intersection of the medium of comics and the discourse of health (King, 2017). This study aims to assess the effect of an educational comic story about preoperative orientation on information and anxiety level of children undergoing surgery.

#### **Literature Searching Strategy**

The authors searched electronic medical and health care databases, including Google Scholar, Ovid,

ScienceDirect, PubMed, ProQuest, ERIC, and EBSCOhost, to find appropriate literature on this subject. As keywords, the following search phrases were used: "preoperative anxiety," "preoperative orientation," "pediatric day surgery," "preoperative preparation," "pre-operative preparation programs for children," "children undergoing surgery," "day surgery," "children preoperative anxiety," "pre-operative education," "preoperative psychological preparation," "understanding comics," "comics definitions," "history of comics," "comics characteristics," "graphic novels," "comics in health education," "graphic medicine," "storytelling narrative," and "educational comical leaflet".

#### **Literature review**

Up to 5 million children are expected to undergo surgical operations each year in North America and up to 75 percent of them suffer severe preoperative anxiety (Chow, 2017). Severe anxiety was reported in up to 60 percent of all young children undergoing anaesthesia and surgery (Liu et al., 2018). Every year in the United States, nearly 3 million children undergo anaesthesia and surgery and 40% to 60% of them are estimated to experience behavioral tension before their surgery (Gulur, Fortier, Mayes, & Kain, 2019). Such outcomes are problematic for children and their families as preoperative anxiety it has been shown to lead to psychological and negative behavioral problems (Mamtora et al., 2018).

Several variables in children lead to preoperative anxiety, including fear of physical damage or harm to their bodies in the form of pain, disfigurement, afraid of waking up during the operation or even death; abandonment by a parent,

separation from significant others as their siblings, or absence of trusted caregivers and witnessing of anxious parents; unfamiliar hospital environment, strangers and the unusual hospital routine like food and clothes; uncertainty and confusion about the acceptable behavior during hospitalization; loss of control, lack of autonomy, incompetence, and independence; invasion of privacy through exposure and touching of private parts of the body and experiencing guilt, and medical terms (Aytekin, Doru, & Kucukoglu, 2016). Higher levels of childhood preoperative anxiety were associated with factor that included age; temperament; history of prior hospitalization; process of induction of anaesthesia; and extent of parental anxiety (Millett & Gooding, 2017).

The level of preoperative anxiety depends also on the operating room environment as higher anxiety level found in an overcrowded operating room during anaesthesia induction; prolonged waiting time between hospital admission and induction of anaesthesia; unpleasant memories of prior hospital experiences; intravenous induction procedures; receiving care from untrained personnel; light intensity of the operative room construction, and noisy operating room with fearful alarms and machines sounds (Kar, Ganguly, Dasgupta, & Goswami, 2015).

Stress points are certain periods during the preoperative phase where anxiety hits the peak level. These stress points are including parental separation or separation of the trusted caregiver; the entrance to the operating unit; positioning the child on the operating table; syringes and needles visualization; placement of cardiac monitor electrodes; intravenous procedures such as cannula insertion, and attachment of the

anaesthesia mask (Kar, Ganguly, Dasgupta, & Goswami, 2015).

Mismanagement of preoperative anxiety can lead to several undesired outcomes included postpone essential surgical and diagnostic procedures; prolonged postoperative recovery and hospital stay, and increase patients' requirements of postoperative medical intervention (Vagnoli, Bettini, Amore, De Masi, & Messeri, 2019). Physiologically, anxiety boosts sympathetic function and raises serum levels of adrenocorticoids, prostaglandin, catecholamines, prolactin, and cortisol, and consequently results in increased heart rate, respiratory rate, elevating blood pressure, and increase the myocardial oxygen demand. On the other side, it decreases the pain tolerance and therefore raises the experience of postoperative pain (Babaei, Alhani, & Khaleghipoor, 2019).

Up to 25% of children having surgery are expected to need restraint during the introduction of anaesthesia. Moreover, anxiety related to anaesthesia induction has many consequences including regression in behavior or dysfunctional behavior that may last months after surgery (Sims & Khoo, 2020). Postoperatively it has been shown that children who experience significantly high preoperative anxiety experience more postoperative pain, and are at a greater risk for hurting themselves, scratching the surgical site, and accidentally removing of intravenous catheters, surgical dressing, and the attached medical devices due to the immediate postoperative delirium (Millett & Gooding, 2017).

Due to these drawbacks and these disadvantages, it is important to assess and avoid preoperative anxiety prior surgery, since this is believed to improve

patient comfort, minimize potential intraoperative problems relevant to the surgical process, and minimize anaesthesia complications, shorten the postoperative patient stay, decrease the hospital's economic expenses and decreasing the waiting period on surgical lists (Prado-Olivares & Chover-Sierra, 2019).

Regarding pharmacological management techniques, Sola et al. (2017) reported that one of the most widely used interventional strategies for the prevention and management of preoperative anxiety in children is sedative premedication. The key aims of premedication administration are to promote an anxiety-free isolation from caregivers and a smooth infusion of anaesthesia. Other effects of pharmacological preparation include amnesia, anxiolysis, cardiovascular stress prevention (e.g. preventing tachycardia), and analgesia. (Cote, Lerman, & Anderson, 2018). Non-pharmacological interventions are preferable over the pharmacological therapy as it is well tolerated and devoid of side effects of drugs (Radhakrishna, Srinivasan, Setty, Melwani, & Hegde, 2019). It has noted that there was a tremendous focus on relieving the physical symptoms related to surgical procedure such as pain. However, the psychological related aspects are often be neglected (Mechtel & Stoeckle, 2017).

There are a variety of hospital-based preoperative preparation programs applicable for children to relieve their anxieties, such as clowning, computer games, and ADVANCE preoperative preparation program, which consist of anxiety-reduction skills, distraction, video-modeling and education before surgery, adding of parents and promoting family-centered care, no excessive

reassurance, coaching, and exposure/shaping of child via induction mask practice (Liu et al., 2018).

Studies suggest that children who experience surgery tend to get specific details about what they are going to face and what is going to happen in the operating room. Pre-procedural evidence tends to decrease the fear of the unknown and improve the child's sense of control, and it is also a human right. When children kept uninformed, they feel alone and insecure, which tends to increase their preoperative anxiety level (Fronk & Billick, 2020 & Liguori et al., 2016).

Scott McCloud (1993) defines comics as a narrative sequential art, intended to produce an aesthetic response and convey information to the viewer. Comics have the power to increase the quality of life of those interested in the production or reading of comics and to alter perceptions, knowledge and actions about social problems and issues (Priego, 2016). Comics are an unlikely but viable channel in health communication, not only it has psychological and cognitive effects, but also it can translate of lived experiences into stories (Dobbins, 2016). Furthermore, educational comics as a promising health awareness platform can do much more than just communicate illness facts, but it can also help children cope with the emotional and psychological implications of medical conditions (McNicol, 2014; McNicol, 2017).

Comics are influential and entertaining arts, which are popular since the 19th century, which was associated with children and uneducated people (Kunzle, 1973). Comics are also defined as a visually and sequentially narrative literature genre presented by hybrid images and words (McCloud, 2007). Comics are not merely a display of text

and image interaction or episodic narrative; they are a system guided by a collection of iconic images (Groensteen, 2007). Without needing to focus too much on text, comics have a long history of transmitting knowledge through photos (Schneider, 2014). Comics are a form of visual narrative communication that combines both words and cartoon panels to create a narrative that not only appeals artistically but also informatively to readers (Muzumdar, 2016).

Using comics as a health education medium have numerous purposes including; promoting the public awareness of disease risk factors and related symptoms; preparing children for hospitalization and medical-related interventions; assist patients in making decisions such as helping patients decide between treatment options and enhance the patient's understanding and adaptation with health-related conditions (McNicol, 2017). Comics can be very useful for communicating quickly and directly important information to a reader who might be under great stress. Comics have the advantage of generally being low cost and carry the ability to potentially transcend language and literacy barriers (Lalanda, Altisent, & Delgado-Marroquín, 2018). Moreover, Comics have the potential to inspire the reader to more readily connect to the characters and the portrayal of characters in graphic fiction can be more imaginative and emotional than actual picture depictions (Ashwal & Thomas, 2018).

Comics as a medium has several benefits for readers, also has several advantages over text or images alone (Steinberg, 2018). Comics seems appealing because they are significantly associated with attractive reading and emotionally effective. In addition, the

medium tends to be readily available to a patient or family member who wishes to read about an illness, comics may invite patients to become acquainted with their medical situation and not fear, even though it is inherently threatening (Myers & Goldenberg, 2018).

There are two types of educational health comics: personal memoir comics related to health, medical, or illness experience and, instructional comics (Ashwal & Thomas, 2018; King, 2017; McNicol, 2017). The personalized memorial comic often called graphic pathography which is stories of illness conveyed in comic form and reflected a personalized health care experience. These personal centered comics can be presented in different forms ranging from a realistic, documentary-like style to more metaphorical representations. This style of comic highlights a single patient's personalized experience, which may vary precisely from that of other patients. Therefore, health care providers should bear in mind that the value of educating patients may be more than communicating detailed and complex medical information to represent relevant concepts and accurate representation of potentially disease-related emotions (Ashwal & Thomas, 2018).

Medical comics do not have to be funny, juvenile, nor need superheroes. They can be used to address serious or light issues. They can be portrayed in various forms, such as single-panel cartoons, comic strips, graphic novels, and can be expressed as fantasy, humor, drama, memoirs, etc. They are not yet very popular because many health care providers have not considered its value (Aguolu, 2018).

Preoperative education helps not only to train the patient for their procedure, but also to train them for what

to expect after the procedure (Sally Moyle, 2017). Preoperative planning allows patients to have a better view of their surgery; a sense of comfort and self-control; less discomfort and anxiety following surgery; a shorter hospital length and get an earlier period of healing (Tollefson, Bishop, Jelly, Watson, & Tambree, 2012).

Preoperative Information should include information regarding the sequence of events; preoperative preparation procedures such as fasting protocol and grooming; invasive preparations such as intravenous cannula insertion, pre-anaesthesia induction medications and what may be felt when the anesthesia is induced; post-anesthetic care unit treatment and recovery information; postoperative expectations; for example, installation of IV fluids and wound drain; postoperative coughing and deep breathing exercises; pain management and, any other specific information to the undergoing surgery (Koutoukidis, Stainton, & Hughson, 2017).

Presentation strategies for health education are increasingly evolving to suit new forms of media. Therefore, it is possible to deliver medically related data across several types. Comics foster dialogue of many subject fields of addition to humor, so they have been used in medicine to illustrate narratives related to disease and act as a promising medium for learning about medical health conditions, attitudes, emotions, and social interactions (Mendelson et al. 2017).

#### **Conclusion**

Although research into the field of educational comics is fairly new, the introduction of comics into education seems to be expanding rapidly. In the medical humanities area, there is a trend

to bring comics into health education by using comics to communicate and promote health. Comics are a creative means of educating and learning about the disease, illness experiences, and other subjects related to wellness. Comics will support and empower children in ways that increase their preoperative knowledge and, in exchange, decrease their level of preoperative anxiety and potentially contribute to improved health outcomes. So, it's time to encourage healthcare providers to develop a standardized educational comical curriculum for children scheduled for various surgical procedures.

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