



RESEARCH ARTICLE

The Value of Cartoon Figures in Medical Education and Health Awareness

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The use of cartoons in medical education and health awareness has developed greatly in the last decade. Many difficult theoretical thoughts become very accessible and easy to understand through the use of comic cartoon figures, to facilitate the learning process for the study materials. On the other hand, the use of these materials in a non-dependent technique, can harm the learning process at all. This literature review mainly examines the main possible uses of comic characters in medical education and how to deeply identify the main evidence-based rules for creating an effective comic material in medical education and health awareness fields. Search on MEDLINE, Psychl-NFO, and EMBASE for scientific publications addressing the use of cartoon figures material in medical education and health awareness were done. Then, all retrieved original studies scientifically examined, reviewed, and summarized to compare the use of cartoon characters in medical education with traditional study materials. Comic figures-book have long been used in this field, with a notable recent increase in use. However, despite this longstanding use, the documented significant evidence of the values of comic books is still insufficient. However, comic books can be used to change knowledge in medical education and increase empathy and behavioral changes between physicians and patients in health awareness and practice. **In conclusion**, the current published articles regarding the value of usage of cartoon figures in the medical education and health awareness are not clearly enough to explore their values. So, more deep research with special considerations to the procedure that involves cartoon figures in the medical educational process, possible applications in health practice and finally efficiency of highly -quality comic figures by expertise personnel in the medical educational and health awareness materials are encouraged.

INTRODUCTION

Learning materials supported by comic graphics allow the teacher to actively incorporate the graphic elements into the learning process to increase its efficiency and facilitate the learning process (Mohamed et al.,2019). Educators in the medical field are currently increasing their use of graphics in the medical learning process, as evidenced by many articles, such as Detajin et al. (2017), who found that students who participated in their study scored high for the group that relied on comic-style handouts and had a higher academic score on the post-learning exam than students who relied on traditional handouts, with more significant results for students with low academic scores(Detajinet al.,2017).Graphic photos can be handmade or computer-generated. However, both are time-consuming and expensive, especially for high-quality photos. In addition, illustration may not be effective and its value to the medical education process may be inefficient. Therefore, educators in the medical field and health care providers in the health awareness field should know how best to use comic book graphics in order to use them effectively (Joshiet al.,2019).The objectives of this article are to clarify the potential applications of comic book characters in the medical education and health awareness fields, to identify the basic criteria for the design and use of graphic

characters in these fields, and finally to outline a specific approach for the forthcoming research on the value of comic book characters in medical education/health awareness materials. To accomplish these goals, we conducted an in-depth study of medical education and health awareness materials using cartoon characters

History: the use of cartoons in medical education and health awareness is not a new attempt in the medical learning process. In the mid-twentieth century, cartoon characters were included in the professional medical education and health awareness of a national health care system. ⁽⁸⁾

Definition: A cartoon is a simple drawing technique that depicts the characteristic features of any person in a clearly exaggerated, satirical manner. It can be used in a medical textbook or handouts. We can also define a cartoon as a drawing in a certain pattern for caricature, humor or satire thoughts. Generally, cartoons use simple lines and basic colors in addition to lettering to make them clear (Tilley, 2018).

Graphic medicine: it is a terminology created by Ian Williams (cartoonist and doctor) in 2007, which is a definition of medical education study conducted through comics: "intersection of the medium of comics and healthcare discourse"clear (Ian Williams, 2007).

Disadvantages: The relationship between comics and medical education has a long history in which there has been an appreciation and development in some periods, while in other periods there has been a deterioration, mainly due to the damage done by comics in 1950 (M. Keith Booker, 2014). The fear of the use of comics in medical education led to an unpredictable significant decline in the usefulness of comics in medical education for several decades, this decline in the popularity of the use of comics, persist for a long time, until recently resurgence (David, 2009).

METHODOLOGY:

Conducting a literature review on the effectiveness of comic figures in medical education and health awareness processes. I constructed a framework for our article, this framework consists of four main points to address, the first is to identify the research question, the second is to identify the related articles, the third is a selection of the appropriate relevant study to the research point, and finally, the fourth is the collection, processing, summarising and reporting of the data of the results provided.

Research question:The research question of the current article is how to use the graphic comic in medical education and health awareness process and what are the results of these applications.

Relevant studies to the research:Identifying studies that are closely related to our research objective can be considered as the most important point that affects the efficiency of the research. The more related articles to the current review article are investigated, the more valuable and clear results are obtained. All members involved in the current research to be found in the research strategy, the greatest suitable related efficient articles involved in the current review. The database search sites include PubMed, Scopus, Web of Science, Education Resources Information Centre (ERIC), ScienceDirect, Google Scholar, and Directory of Open Access Journals (DOAJ). All results with relevant reference to research terminology (comics, medical education, and health awareness) were included in this article. Web searches were conducted without restriction so that the results that could be obtained were as broad as possible; the current research was conducted in November 2022. Overall, the above search methods, all studies involved in the current article were manually checked individually for web availability, for all reference lists.

Selection process of the appropriate study:

Inclusion criteria: To include a study in the current article, the following criteria should be met: 1) the study should be related to the medical field or health awareness, 2) the study should be classified in a comical spectrum, 3) the study should be created for an educational goal.

Exclusion Criteria: To exclude a study from the current review, one of the following criteria was included in the reviewed excluded study: 1) the study contains animation, 2) the cartoon in question has a political theme, 3) the study relates to a therapeutic procedure (art therapy), and/or the study is a literature review.

Limitless boundaries; in terms of the year of study was published, the language used in the study, the methodology used to build the study. Thus, all of the previously mentioned items have no limits.

Reporting of results provided:

Charting procedure; all studies that met the inclusion criteria were charted using a customizable data extraction sheet designed by the author; the elements involved in the usable data extraction sheet are the type and nature of comedy, the results of the study, and finally the valuable conclusion of the study.

RESULTS:

In this paper, 14 studies on the use of comics in medical education of medical students were examined

In 2013, Michael Green's research paper titled (Teaching with Comics: A Course for Fourth-Year Medical Students) found that comics increase medical students' engagement in medical education and improve their visual and narrative skills, especially after studying medical comic stories, and eventually significantly increase diagnostic performance for various medical diseases (M. J. Green, 2013).

Also, other authors came to the same conclusions (Green and Myers, 2010; Keller, 2013; D. R. George and M. J. Green, 2015). They reported the value of comic stories in medical education, especially in increasing the empathy of medical students toward variable, crude medical knowledge, especially after a significant decrease in the empathy of medical students with a vast knowledge of medical information to be studied by them. This empathy and emotional feelings can be improved by using comic characters and stories in medical education.

Two research articles by Shin (2013) and Kim (2016) established the effective role of comics in medical students' learning of anatomy. The students studied who participated in this research showed a significant statistically significant increase in interest in anatomy study with a high score on the final exams, so the use of comics may motivate other university staff to use comics in anatomy study (Shin, 2013; Kim, 2016).

A group of authors such as Mohamed et al., 2016 used a comic figure as a teaching method for nursing students and found very positive feedback from students, as the use of these comics increases learning capacity and memory to recall information, students are more engaged in interactive learning procedures, and can easily recall the acquired knowledge in important clinical situations. In addition, the students suggest that these innovative teaching methods should be used more in the next medical curricula (Mohamed et al., 2016).

Regarding the value of using comics in medical education to the public, a study in Japan over two years (from September 2010 to September 2012) investigated the value of using comics in obtaining written consent for emergency surgery for cerebral stroke (intracerebral haemorrhage) in patients in the neurosurgery department. They found that it is of great benefit to the physician to obtain consent quickly and comprehensively. Like comic clear and quick explore brain anatomy, function and brain pathology of intracerebral haemorrhage (Furuno et al., 2015).

Comic has a significant statistical role in speeding up the management process of children with amblyopia when used as educational material for learning these children, the author attributed the acceleration in the journey of treatment for increasing the compliance of children for the lines of treatment, more in immigrant children who spoke Dutch poorly, so comics more facilitate the learning content than just the use of language (Tjiam et al., 2012).

An Anderson study, 2016 showed the effectiveness of comic figures in improving the therapeutic aspect of physician-patient relationship, as the authors provided a well-structured comic figure for the doctor to use as a teaching tool for his patients, and found high effectiveness in raising patients' awareness, resulting in greater patient satisfaction and improvement in patients' mental and physical health (Anderson et al., 2016).

DISCUSSION

The articles discussed in this review provide a picture of the overall value of graphic medicine and comic figures in medical education and in the daily practice of physicians as educational tools for

their patients. This research journey on the impact of comic figure in medical education began with a 1958 research article discussing the value of using comic books in health educational purposes for students in high school (Leah Zhang-Kennedy et al., 2017).

The process of using comics in medical education continued steadily through the late 1990s and early 2000s. One of the notable impacts of comics in the period around 1000, when a study was conducted in Egypt, was to overcome the barriers of cultural barriers to solve the problem of Filariasis in Egypt, and by increasing awareness of filariasis, significantly reduce the prevalence of the disease in Egyptian children (El-Setouhy, and Rio,2003).

Graphic medicine terminology began to appear in 2007. Up to this point, about 160 studies have been published dealing with comics and medical education processes, with a high rate of development for the topic in the last year. William Ian, author of *Graphic Medicine*, noted that about 50% of the previously enumerated articles were not published at the national or international level, so it is difficult to interpret their results in terms of the impact of comics on medical education, especially when responding to the question of the relationship between the quality of comics and the results obtained (Williams, 2019).

A valuable observation by Willis (2016), he discovered that one can improve the findability of one's publication in web searches of scholarly media by including the word "comic" in the title or keywords, making the publication easy to find without confusion (Willis et al., 2018).

Regarding the quality of comic graphics and their effect on the medical education process, many research articles have demonstrated that a high-quality designed comic handout leads to better posttest results than a handwritten handout. These best results are attributed to two reasons: The first reason is that a well-designed comic attracts students' attention while reading as mentioned by many authors (Shin et al., 2013; Sim et al., 2014; Joshi et al., 2015; Kim et al., 2016). Moreover, the second reason is the better understanding of complex medical concepts by three theories; the first theory is the "theory of combination of image and text message". It states that the combination of visual and verbal stimuli in medical education helps students to better understand any learning topic (Mayer, 2010; Issa et al., 2011). The second theory is the "metaphor and analogy theory", which mainly focuses on the connection of unknown knowledge with images to help students understand through a strong connection between abstract and concrete knowledge (Wormeli, 2009; Niebert et al., 2013). Finally, the third theory is "storytelling" to make the subject more memorable by depicting the content of the story with cartoon characters (Green, 2004). This is because, in addition to the stimulating effect of stories on cognitive functions, they have an assertive influence on the success rate of learning activities (Clark and Rossiter, 2008).

SUMMARY & CONCLUSION

Comic figures have long been used in medical and health education, with a notable recent increase in this use. Despite this longstanding use of comic book figures, the documented significant evidence of the values of comic figures is still insufficient, and more research articles are needed to substantiate these values, such as the ability of comic figures to transform difficult knowledge in medical education, increase empathy, and effect behavioral change between physicians and patients regarding health awareness and practice. Therefore, the authors suggest that further research be conducted, with particular attention to the process of incorporating comic figures into medical education, the potential applications of comic figures in health practice, and the effectiveness of high-quality comic figures by professionals in medical education materials. The author of the current research hope that this article will be one of the basic primary sources of materials for the use of comics in medical education and health awareness process.

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