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Preparing Infographics for Post-publication Promotion of Research on Social Media

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ABSTRACT

Infographics are pictorial representations of information intended to disseminate information quickly and clearly. Their use has increased in the past decade due to wider and easy access to technology. Infographics are being increasingly used for public advisories, disseminating protocols for healthcare professionals, and post-publication promotion of research. Due to their potential to rapidly reach a vast audience, these have gained larger importance during the coronavirus disease 2019 pandemic. Two key aspects determine the quality of infographics, content and visual appeal. In this brief, the authors attempt to delineate the key aspects of designing an infographic, and the freeware that they may have at their disposal for creating informative, appealing, and useful infographics.

Keywords: Infographics; Publications; Health Personnel; Pandemics; Publishing

INTRODUCTION

Infographics are pictorial representations of data or knowledge intended to disseminate information quickly and clearly. In this digital era, information embodies power. With various tasks at hand, both healthcare workers and patients are time-pressed, and in the quest for reliable and valid information presented in a precise and clear manner.

With an increasing volume of published medical literature, it is challenging for healthcare professionals to keep abreast of all new research findings due to barriers of time constraints and volume of published literature.¹ Promotion of articles using infographics on social media platforms (SMPs) has the potential to provide rapid and effective dissemination routes for concise and practical information.¹⁻⁴ Besides, the visibility of articles on SMPs is an important measure of use and attention, known as Altmetrics. Wider dissemination among researcher community such as on Mendeley is known to translate into better Altmetric scores. Research showcased on SMPs as infographics are known to gather higher altmetric scores.¹

Infographics containing patient-specific, real-time data about the clinical presentation, key risk factors, and adverse outcomes of diseases are not only useful for the patients and healthcare professionals. Still, they may also act as a beneficial tool for shared decision-making

among future healthcare policymakers.^{5,6} In the time of coronavirus disease 2019 (COVID-19) pandemic, infographics have emerged as an effective tool to deliver credible medical information with relevance to public health due to the rise of unverified pandemic related information on SMPs.⁷ They are particularly used for disseminating clinical recommendations and prevention strategies⁸⁻¹¹ and in telemedicine for guidance on home-based care.¹²

Unique advantages of using infographics in science

The primary principle of designing a good infographic encompasses breaking down information into content that is simpler and easy to understand, visually appealing, and information that can be gathered quickly. Infographics are perceived as a more enjoyable format for reading than conventional text.¹³ These visual nuggets of information are built on the premise of most efficient retention of data obtained visually, despite the ever-shrinking short attention spans due to widespread use of social media in the current generation.^{14,15} Infographics hold the potential to get information across thousands of people in a short time.

Besides, images are processed faster than text by the human brain.¹⁶ Infographics are known to improve student retention, thinking and learning skills.^{17,18} A combination of visual and verbal information is even better for information recall and may enhance critical thinking.^{17,19,20} In a study conducted by Martin et al.²¹ on healthcare professionals, reviewing article summaries in infographic format was associated with lower cognitive load scores than reviewing articles in text-only abstract format. The use of infographics by healthcare professionals will be less mentally taxing and could improve their knowledge of new medical evidence.

While infographics and videos may perform equally well, the former may be preferred in the longer term due to easier viewing.²² Another distinctive advantage is the ability of these to communicate important information across people of varied subject matter related to literacy, making them particularly useful for public health advisories.²³⁻²⁶ They are also being used to improve research literacy among trial participants.²⁷

DESIGNING A GOOD INFOGRAPHIC

The content and visual appeal are two aspects vital to the creation of a good infographic.^{19,28-33}

Content appeal

1. The information to be presented should be concise, understandable and self-explanatory for the convenience of the viewer.
2. Brevity is the key to better attention of the reader. Hence the idiom 'less is more'; the creators should aim to convey curated and the most important information only, by using the least words possible.
3. Representation of data using graphs, flowcharts, tables, mindmaps, lists, area diagrams, word clouds, charticles, etc., may enhance the reading experience and help in better retention of information.³⁴

Visual appeal

1. The visual content should be arranged without over or under crowding.
2. For academic or scientific infographics, a greater focus on content rather than design is recommended. The design should covertly engage the audience. In other words, the appeal may not be the priority.

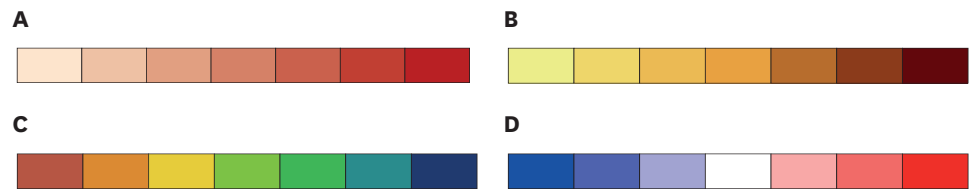


Fig. 1. Types of colour schemes (A) Monochrome Sequential Colour Scheme. (B) Part-spectral Sequential Colour. (C) Divergent Colour Scheme. (D) Spectral Colour Scheme.

3. Careful choice of colour scheme for infographics may enhance the style and appeal. A colour scheme which is not appealing to the eye is immediately noticed by the person reading it whereas an aesthetically pleasing scheme is automatically satisfying, and the reader is instantly drawn to the infographic.
4. Pre-designed colour palettes available from a free and open platform for colour inspiration on the internet³⁵ can help attain symmetry in a time-efficient manner (Fig. 1). Various freeware listed below have in-built colour schemes as well.
5. Humans have an inherent appreciation for many symmetrical aspects of the natural world, such as markings on coral reef fish and butterflies.³⁶ This appears to extend to a more general sense of aesthetics or visual appeal. Colours and arrangement of the elements in the infographic comprise a highly important part of this.
6. Uniformity should be maintained for a clean look. For example, use of many different fonts is best avoided. One font for body text and one for headings is ideal. Spacing between different elements should be equal when feasible.

FREWARE FOR DESIGNING INFOGRAPHICS

Various tools can be helpful to create an effective infographic. The authors suggest the following after using them for a significant amount of time. Canva and Microsoft PowerPoint are the most commonly used tools for the creation of infographics by medical personnel. The use of Canva is popular for social media marketing by professionals as well. The authors compare and contrast the two (Table 1) while discussing the other easy alternatives for authors and editors for creating infographics.

Mind the Graph (<https://mindthegraph.com/>)

Mind the Graph is an easy to use website application specifically designed for the scientific research community. It offers thousands of pre-designed templates catered for various research-oriented topics like pneumonia, COVID, and vaccination, which can be edited as per the needs of the user. Apart from the usual elements and shapes, this application has thousands of scientifically accurate icons/illustrations for human body organs, various types of cells, the morphology of bacteria, and many other topics. Its unique feature called 'on-demand graphics' allows users to demand an icon from the app developers if it is not available. Additionally, it offers a wide variety of text designs, the ability to create graphs and flowcharts, and custom sizing options for the templates. The major disadvantages are that free users have to include the watermark in their projects, have to cite Mind the Graph when publishing or presenting their work, and team sharing of the infographic is not possible. The free version also has the limit of one infographic per user.

Table 1. Comparing features of Canva and Microsoft PowerPoint

No.	Canva (https://www.canva.com/)	Microsoft PowerPoint
1	<ul style="list-style-type: none"> • An easy to use website application which does not require any technical expertise (Skill level: Beginner). • Some of the more advanced features will require a paid pro account. 	<ul style="list-style-type: none"> • An easy and completely free to use desktop application (Skill level: Beginner to Intermediate).
2	<ul style="list-style-type: none"> • A simple and attractive interface which can be mastered easily. 	<ul style="list-style-type: none"> • The interface is very similar to Microsoft applications like Word and Excel, which is easy to master if not used previously.
3	<ul style="list-style-type: none"> • It offers thousands of pre-designed templates to choose from in case of a time crunch. 	<ul style="list-style-type: none"> • It is more time consuming as everything has to be designed from scratch.
4	<ul style="list-style-type: none"> • It has a variety of fonts and colour schemes to choose from. 	<ul style="list-style-type: none"> • It has more variety of fonts and colours to choose from, as compared to Canva. New fonts can be uploaded easily without having to make any in-app purchases.
5	<ul style="list-style-type: none"> • It offers in-app pictures/photos; which fall under the Creative Commons Attribution to avoid copyright issues but, in the free version, most pictures and elements bear the Canva watermark to reflect branding which may appear distracting. 	<ul style="list-style-type: none"> • It offers in-app pictures/photos from variety of online sources; which fall under the Creative Commons Attribution to avoid copyright issues but, they do not bear a watermark.
6	<ul style="list-style-type: none"> • It also offers supporting elements like icons and shapes. 	<ul style="list-style-type: none"> • It offers a limited number of supporting elements like icons and shapes.
7	<ul style="list-style-type: none"> • There is limited flexibility in terms of making graphs, flowcharts, tables, mindmaps, lists, etc. 	<ul style="list-style-type: none"> • It offers more creative freedom in terms of making graphs, flowcharts, tables, mindmaps, lists, etc. • Furthermore, the Insert SmartArt Graphic option makes it easy to visually communicate information through lists, process diagrams, Venn diagrams, organization charts, etc.
8	<ul style="list-style-type: none"> • The slides can be designed in any size according to the SMPs (eg. Facebook, Twitter, Instagram, etc.) one is using to present the infographic. • However, resizing the infographic after it has been made is not possible. 	<ul style="list-style-type: none"> • The slides can be designed in any size and resizing them after they have been made is also possible.
9	<ul style="list-style-type: none"> • Team sharing of the infographic is possible if more than 2 people are working on the design. 	<ul style="list-style-type: none"> • Team sharing of the infographic is possible through Cloud storage on OneDrive.

Pablo (<https://pablo.buffer.com/>)

Pablo is a freeware compatible with the beginner-level skill base and easy to operate with minimal technical expertise. It is primarily suitable for image-based infographics and thus does not offer much creative freedom to create more customized infographics using graphs, charts, tables, etc. It has thousands of in-app pictures/photos to choose from; which fall under the Creative Commons Attribution to avoid copyright issues but has very limited editing options for them. Posts created using this can be resized to fit SMPs like Facebook, Twitter, Instagram and Pinterest only.

Adobe Spark (<https://spark.adobe.com/sp/>)

Adobe Spark is a freeware that does not require any technical expertise and is very similar to Canva in functionality and features. It features unique design frameworks with different infographic styles and appeal. Additionally, it offers advantages of a wide variety of fonts and colour schemes, and the option to resize the infographic to fit different SMPs. Infographics created using this application can be shared and edited by multiple people but building a team account is not possible.

Infogram (<https://infogram.com/>)

Infogram is an application specifically designed for presenting data in the form of graphs, charts and maps. It allows users to integrate website links and YouTube videos into the infographic. The major disadvantages include a watermark/logo on the content and inability to download the infographics from a free account. However, the infographics designed using the tool can be shared through the website.

The use of elements is common to all platforms and may allow transfer from one platform to another. This may aid in the creation of more impactful infographics. SmartArt, graphs, tables, and design elements may be useful to the same effect. For high-quality images, saving

the desired piece as a picture in a .png (Portable Network Graphics) or a .svg (Scalable Vector Graphics) format/type is suggested for the best results. Lastly, in the era of digitization, automated algorithms are being developed to extract templates from real-world timeline infographics.³⁷

Some additional freeware available on the internet are:

1. Google Charts (<https://developers.google.com/chart>) - It is a powerful and simple to use website application for creating infographics in the form of visually appealing mathematical charts.
2. Piktochart (<https://piktochart.com/>) - It is a website application which allows even beginners to create infographics.
3. Snappa (<https://snappa.com/app>) - It is an application similar to Canva except that, most pictures and elements do not bear a watermark.
4. Visme (<https://www.visme.co/>) - It is yet another free application similar to Canva.

CONCLUDING REMARKS

Infographics are pictorial representations of information, data, or knowledge intended to disseminate information quickly and clearly.^{17,38} This is not a new concept but has still gained popularity recently due to the technology which has impelled the analysis of data and text to become easier and more accessible. The tools of production of infographics are no longer reserved for certain specialists; now amateurs can also try their hand at them.³⁹ Infographics have been used in the recent past for patient-centered care^{22,40-42} and public health benefits like prevention of diseases,^{43,44} communicating overdose prevention strategies,⁴⁵ to increase clinical trial participation^{46,47} which allow for a better patient understanding of their health and empowers patients to participate in their healthcare. Recently Chan et al.² disseminated an infographic delineating the principles of airway management focusing on infection control for healthcare workers in the early COVID-19 pandemic period. The infographic and its various language translations were well received and received over 64,000 impressions on Twitter and were later adapted by reported organizations for a wider readership. Healthcare workers drive the rapid uptake' is a prime example of the utility of this technique. Furthermore, the use of infographics by healthcare professionals and medical editors alike could reduce article reviewing time and facilitate faster publication, dissemination and uptake of new medical evidence.^{21,28}

The pandemic period has seen a rise in the use of infographics for the promotion of scientific literature on SMPs.⁴ With many journals introducing infographics alongside articles,⁴⁸ their use for providing concise and practical information, attract audience attention and increase the visibility of items is likely to gain a greater foothold in the future.¹⁻⁴

The process of infographic designing in the past was difficult and time-consuming, especially for laypeople, because the tools required users to manually initialize most of the design (e.g., drawing graphical elements). With the introduction of automated infographic design tools, it has become easier to design such infographics.⁴⁹ Using templates is an effective approach to enable automated infographic design, which has been widely used in commercial software, such as Microsoft PowerPoint and Adobe Illustrator. These systems can automatically generate infographics by plugging in data to a design template. However, these systems typically only provide limited types of templates with default styles, which leads to a lack of diversity and has less control over creative freedom.³⁷ Custom templates can be created with ease by

investing a little more time for a more personally curated infographic. Creation of an animated infographic can further benefit healthcare professionals, patients and students alike.⁵⁰

To conclude, the use of infographics tends to disseminate information quickly and clearly and has the advantage of being perceived as a more enjoyable format for reading. Advancement in technology has further made the process of infographic creation easier and more accessible.

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