

# Correspondence

## Visual abstract: An innovative way to disseminate scientific research

Academic journals and conferences are traditional media through which researchers disseminate their research, scientific data and observations. Eventually, such information is utilized in systematic reviews and meta-analyses to formulate clinical guidelines. Although the academic publishing model has seen a transition from a subscription, print-based to open-access or hybrid online versions, an introductory abstract is still an essential component that provides a 'snap-shot' view of the ensuing published scientific article.<sup>1</sup> Therefore, it is imperative that the summary or abstract is clear, unambiguous and conveys the essential purpose of the research or the clinical study.

Over the past few years, authors and journals have developed innovative ideas to convey the key findings of a research study to the readers and a wider audience. The Altmetric Attention score (Altmetrics) is one such complementary measurement of a research article compared to the traditional, citation-based metrics or a journal's impact factor. This is derived predominantly from the web-based social media platforms.<sup>2</sup> Similarly, visual abstract (VA) is a visual or graphic summary of the information contained in a written or digital abstract with an aim of improving the display of an abstract and readership of the subsequent article (Fig. 1). Since the introduction of this idea in 2016, the concept of VA is being increasingly used by scientific journals, academic conferences and even health magazines to boost visibility of their literary content.<sup>3</sup> This has become even more relevant during the Covid-19 pandemic when virtual-learning platforms including e-education models have been promoted as effective modalities to disseminate continuing medical education and journalistic content.<sup>4</sup>

VA provides a concise visual summary to help readers scan and find the most relevant content for them. VA briefly informs the reader of the key findings of the article before undertaking a detailed assessment of the scientific study, trial or report.<sup>5</sup> Altmetrics provides evidence of increased visibility of scientific content due to VA. Prospective cross-over studies and cross-sectional surveys have shown that compared to standard tweets with links to research articles, VAs of articles were liked twice more and quadrupled retweets.<sup>6</sup> The authors also discuss the framework to convert existing abstracts to VA for wider dissemination, which would eventually increase readership,

potentially advance the care of older adults and benefit public health education. For authors and journals, the introduction of VA can be transformative, with increased exposure of the abstract and consequently greater interest in the article. Interest in reading of the full article may be enhanced.<sup>7</sup> There are also some observations of a trend towards increased citations in journals with established Twitter accounts. Although Altmetric score did not correlate with journal impact factor, future studies may help in establishing the link better.<sup>8</sup> It has been suggested that VA can improve Altmetric score and thus can result in better research dissemination and social media engagement. VA may also play a crucial role in social health interventions and public health education resulting from social media engagement.<sup>9</sup>

Integrating of VA as a dissemination strategy of articles is being embraced by various editorial boards. Increasing number of journals, institutions and organizations are adopting VA in their advertising strategy.<sup>10</sup> However, VA must be used with caution. Diagrammatic representation of data needs an adequate understanding of graphical tools and application of design principles. It is often difficult to draw a VA, especially for descriptive studies or studies focusing on paraclinical subjects such as radiology or pathology. If not designed properly, VA can give incorrect conclusions, and focus on limited aspects of the study by highlighting only partial information. This is especially pertinent to drug trials where efficacy and safety both need to be studied in detail to decide upon their eventual clinical utility. A further challenge is to place large, scientific data in a graphical format for a VA.

Thus, with judicious application and use, VA may be the way ahead in the digital dissemination of scientific research, besides helping in increasing viewership, Altmetric scores and eventually bibliometric scores of articles.

*Conflicts of interest.* None declared

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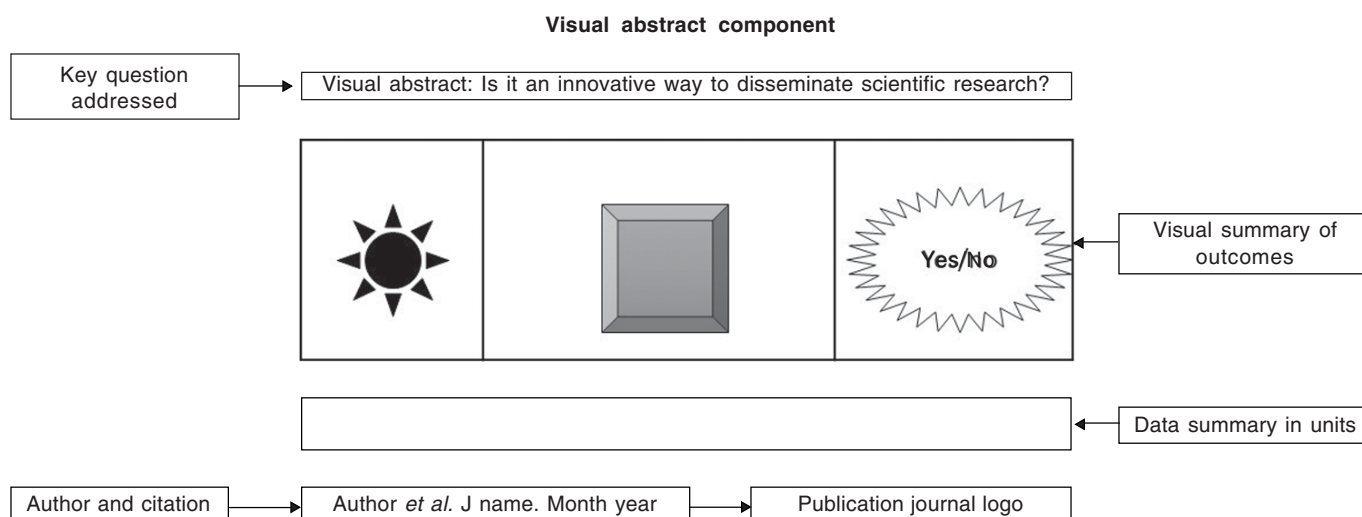


FIG 1. A diagrammatic representation of a visual abstract template

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Karthikeyan P. Iyengar  
Department of Orthopaedics  
Southport and Ormskirk NHS Trust  
Southport, UK

Rajesh Botchu  
Royal Orthopaedic Hospital  
Birmingham, UK

Vijay Kumar Jain  
Department of Orthopaedics  
Atal Bihari Vajpayee Institute of Medical Sciences and Dr Ram  
Manohar Lohia Hospital  
New Delhi, India

Pranav Ish  
Department of Pulmonary, Critical Care and Sleep Medicine  
Vardhman Mahavir Medical College and Safdarjung Hospital  
New Delhi, India  
[pranavish2512@gmail.com](mailto:pranavish2512@gmail.com)

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### Student feedback on the use of gamification for teaching pathology postgraduates

Gamification is a relatively recent approach to medical education which seeks to use the inherent addictive nature of online gaming positively. For a long time, online games have been discredited due to

their addictive nature and sometimes offensive content. Kahoot! is an online quiz-based learning platform with over 70 million users worldwide. It allows teachers to create quizzes with a character limit of 120 characters. The students are supposed to respond to the questions within the time limit set by the teacher. The application then evaluates the responses and displays the leaderboard after every question. The final scores and the top three contestants are displayed at the end of the quiz.<sup>1</sup>

The contestants can attempt the quiz again on their own devices and improve their scores. The key features that make this quizzing game interesting are instantaneous results, an interactive interface, and the fact that the quizzes are available on the app for all contestants to practise later.<sup>1</sup>

According to Aktekin *et al.*, the benefits of Kahoot-based closure program (after each anatomy lecture) are increased attendance and participation, and more attentive and enthusiastic students in the class.<sup>2</sup> Felszeghy *et al.* used a Kahoot gamification program for teaching histology to medical and dental students and concluded that the learning process and participant satisfaction can be significantly improved by introducing Kahoot-based gamification programs in histology courses.<sup>3</sup> Other similar quiz-based gaming applications available are Socrative, Doctor's Dilemma, Quizizz, Quiz maker, Lesson up, Quizlet, and Canvas. 'Ghost mode' on Kahoot allows students to compete against their first attempt to improve their time.

Our study was conducted in May-June 2020 after enrolling first-, second- and third-year pathology postgraduate students of a tertiary care hospital in northern India. This research complies with the guidelines for human research and was conducted in accordance with the Declaration of Helsinki of World Medical Association. Informed consent was taken from the study participants and subject confidentiality was maintained.

A total of 24 of 30 postgraduate students participated voluntarily. The students were asked to download the application 'Kahoot' and 'GoToWebinar' on the same or different devices. The quiz was accessible on smartphones, tablets or personal computers and was hosted at a specified time once a week. A webinar link was provided to the students on the day of the quiz. The game pin was shared with the students by screen sharing on GoToWebinar. Each quiz consisted of 15 multiple-choice questions with four options each and one correct answer (Figs 1a and b). Only 20 seconds were allowed per question. The application awarded points to the contestants based on their accuracy and promptness in answering. The top five positions based on cumulative scores were displayed after every question and the top three contestants at the end of the quiz (Figs 1c and d). Each quiz was followed by a discussion, which was hosted on GoToWebinar with emphasis on difficult questions, i.e. with the most incorrect answers (which was also calculated in the application automatically).

Due to Covid-19-related duties, it was difficult for the students to attend all the five weekly quizzes. Despite this 15 students were able to attend four or more quizzes and only 3 attended two or less.

The image displays two screenshots from a Kahoot! quiz. The first screenshot, titled "13-Quiz ABO Discrepancy due to weakly reacting or missing antibody is?", shows a table with columns for "Group A", "Anti-B", "At Cells", and "B". The options are: Group 1 discrepancy (score 2), Group 2 discrepancy (score 6), Group 3 discrepancy (score 1), Group 4 discrepancy (score 3), and No answer (score 8). The second screenshot, titled "20-Quiz 'Treeman syndrome' also called as:", shows a list of options: Verruciform xanthoma (score 0), Epidermodysplasia verruciformis (score 11), Acrokeratosis verruciformis of hand (score 2), and Placid verruciform papillomatosis (score 0). A "No answer" option has a score of 6. Both screenshots show a 20s time limit and a progress indicator (12 of 20 and 20 of 20 respectively).

Fig 1a and b. Examples of questions asked during the online quiz on Kahoot!