ASEAN Journal of Community Engagement

Volume 6
Number 1 *July 2022*

Article 8

7-31-2022

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Recommended Citation

Sholihah, Lini Anisfatus (2022). The Development of Video Podcast as an Innovation in Online Nutrition Education and Its Engagement Data Analysis. *ASEAN Journal of Community Engagement*, 6(1), 169-187. Available at: https://doi.org/10.7454/ajce.v6i1.1146

ASEAN Journal of Community Engagement
ISSN: 2581-0030 / E-ISSN: 2580-9563
https://scholarhub.ui.ac.id/ajce
Page: 169-187

The Development of Video Podcast as an Innovation in Online Nutrition Education and Its Engagement Data Analysis

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Received: June 7th, 2021, Accepted: July 10th, 2022

Abstract Podcasts have become more popular in Indonesia recently. Studies have shown that video podcasts, which incorporate education and entertainment aspects, are effective as a medium to study language and medical subjects among students and clinicians. This study aims to analyze video podcasts' utilization in nutrition education and how they can engage viewers from the general community. This paper further aims to describe the development of a video podcast, NutriPodcast, as an innovative media to educate the community regarding nutrition topics. The number of audience views was calculated by utilizing the analytical feature on social media. The methodology to develop the podcast consisted of three stages: design, edit, and distribution. The design stage of the podcast refers to planning the style and length of the podcast and determining the media to be used. The editing stage includes both technological and technical aspects, such as hardware and software equipment. YouTube was chosen as the platform to upload the video podcast. The number of views of the podcast on YouTube was comparable to that of another previous podcast research. Most viewers used smartphones to access video podcasts. People from the 25–34 age group (55.2%) and females (51.5%) made up more than half the proportion of the viewers. It can be concluded that a video podcast provides an opportunity to facilitate a community seeking nutrition and health information.

Keywords: Indonesia; nutrition education; online health education; podcast; video podcast.

1. Introduction

The conventional health promotion method, that is, face-to-face community outreach, was very commonly carried out by the Indonesian government before the pandemic. This outreach method typically gathers many individuals in a single spot to receive information from health educators. This service is usually provided by the Indonesian primary healthcare centers known as *Puskesmas.* The activity includes health outreach programs in local government facilities and worship communities, and the target audience is generally high-risk groups of malnutrition, such as the elderly. The Ministry

https://doi.org/10.7454/ajce.v6i1.1146

How to cite the article (APA version):
Sholihah, L. A. (2022). The Development of Video Podcast as an Innovation in Online Nutrition Education and Its Engagement Data Analysis. *ASEAN Journal of Community Engagement*, *6*(1), 169-187.

of Health allocates *Biaya Operasional Kesehatan*, which takes care of the operational expense of these outreach services, such as the transportation of healthcare staff to the community (Mahendradhata et al., 2017).

Unfortunately, this face-to-face health outreach program is no longer feasible during the pandemic as the ongoing health protocols ask people to observe physical distancing and limit outdoor activity to prevent COVID-19 contamination (WHO, 2020). These restrictions have disrupted people's health-seeking behavior (Saah et al., 2021) and enforced health workers to provide innovative and accessible health information to the community.

Podcasts (e.g., the iPhone Podcast) are a new face in educational media conveyance. The term podcast refers to digital audio and video programs that can be subscribed to and downloaded. People can access podcasts by using various digital devices, such as desktop computers, laptops, smartphones, mp3 players, etc. (Carvalho et al., 2009; McClung & Johnson, 2010). A podcast brings both audio and video content to its audience, and it can be accessed repeatedly by using many platforms, such as Spotify, Anchor, Apple Podcast, Overcast, and others. A video podcast is popular and can be watched using the YouTube platform or Instagram. Another benefit is that podcasts are free for everybody over the Internet. Once downloaded to the devices, podcasts can be watched at a later period, even when the Internet is inaccessible (Lomayesva et al., 2020; Zellatifanny, 2020).

Podcasts not only have received increasing worldwide popularity but have also become popular in Indonesian society. It is noticed that podcasts have a large consumer base in Indonesia. A past study conducted between April 2018 and March 2019 showed that 1.56 million Indonesians downloaded podcasts either in the form of an audio or a video file (Roy Morgan Research, 2019).

A study conducted by McClung and Johnson (2010) investigated several intentions or motives for people to access podcasts. These motives consisted of amusement, time-shifting, library building, and social aspects. The respondents of the study stated that podcasts, as an entertainment aspect, are fun and make them happy. Moreover, a podcast is easy to access, and users can enjoy only the podcast they like (time-shifting). File saving feature availability for the podcast is another reason why people access podcasts (library building). The most significant predictor of podcast use according to

https://doi.org/10.7454/ajce.v6i1.1146

the study is social aspects. The study found that people tend to watch and download the podcast their friends or peer talk about.

A podcast is recognized as a potential medium that can enhance students' educational learning outcomes. For instance, in language education, podcasts have been found to help develop students' listening skills and learning motivation. Through podcasts, students can enrich their vocabulary in different languages, including the English language (Darwis, 2016; Edirisingha et al., 2007; Indahsari, 2020; Li, 2010; Yeh, 2014). Medical education is one of the fields that have received enormous consideration in research. It is known that a podcast is useful for increasing students' understanding of the medical subject and subsequently assisting them to develop their test scores as well (Kalludi et al., 2015; Malecki et al., 2019).

Podcasts have been used in the medical education of healthcare workers and specific community settings. The iCritical Care podcast is a commendable medical podcast purposed for the clinicians and the critical care community and has received many positive responses on the Internet. This podcast is delivered using the English language and has been downloaded 68,000 times in its first seven months after its launch (Savel et al., 2007). Another English-speaking podcast discussed in the paper is AmiPal. The AmiPal Podcast focuses on palliative care topics and targets healthcare workers as its audience. This podcast was played across countries, including both native and non-native English-speaking countries (Nwosu et al., 2017). Whereas several studies have attempted to investigate the podcast advantages in medical education for health workers, the use of podcasts in nutrition promotive education with a wider target audience, such as the general community in Indonesia, is still not explored.

NutriPodcast is a new podcast focused on nutrition topics and is created by the East Java provincial government organization, *UPT Laboratorium Gizi*, under the network of *Dinas Kesehatan Provinsi Jawa Timur*. NutriPodcast was used to disseminate nutrition messages to the general community through YouTube, which enables the outreach program to be conducted without the need for face-to-face interactions between the healthcare staff and the audience. This paper aims to describe the development of NutriPodcast as a new method in community engagement service focused on nutrition promotion and education. Moreover, the research on the engagement of NutriPodcast was attempted after it was aired on YouTube. The result of this case study is important

https://doi.org/10.7454/ajce.v6i1.1146

to provide a piece of new information about podcast development and utilization for nutrition promotion and community engagement, especially in Indonesia.

2. Methods

2.1. The project initiation

At the beginning of May 2020, the Unit of Development and Quality Assurance *UPT Laboratorium Gizi* initiated a pilot program focused on nutrition education using video podcasts as a measure to deal with the restrictions on people gathering during the COVID-19 pandemic. The video podcast consisted of six episodes, which were streamed on YouTube during the month of Ramadhan. The topics discussed in the initial video podcasts were (1) grocery shopping tips during quarantine, (2) myths and facts regarding the Ramadhan diet, (3) tips on maintaining body hydration during Ramadhan fasting, (4) nutritional tips for diabetic patients who are fasting during Ramadhan, (5) tips for maintaining body fitness during Ramadhan, and (6) tips for avoiding weight gain after Eid al-Fitr.

The concept of the video podcast was a 30-minute talk between a host and an interviewee who is a specialist on the topic examined. The production of the pilot podcast did not utilize a financial plan. At the end of May 2020, YouTube's video analytics showed that the six podcast episodes had been watched by 339 viewers, and the complete watch length accomplished 10.8 hours.

Since NutriPodcast, which was a pilot project, resulted in the desired view outcomes, it was considered an effective community engagement technique to educate the masses on nutrition during the pandemic. *UPT Laboratorium Gizi* included NutriPodcast as its annual work program in the following year. The project then was financed by the East Java Provincial Government Budget or *Anggaran Pendapatan dan Belanja Daerah Provinsi Jawa Timur*. The funding was allocated to purchase audio-visual recording hardware, such as cameras, microphones, and a sound recorder.

2.2. NutriPodcast development

NutriPodcast was developed by Fernandez et al. (2015). The strategy to foster NutriPodcast included three fundamental stages: (1) designing, (2) editing, and (3) distribution (Fernandez et al., 2015). Each stage is described in detail below.

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2.2.1. Designing stage

The first stage of NutriPodcast development was to design its style and length and identify the media (audio or video) to be used for the podcast. The staff members in *UPT Laboratorium Gizi* sat through several formal meetings and brainstormed to come up with an appropriate design for the podcast. They also referred to data from previous literature. The discussion resulted in NutriPodcast adopting an informal style conversation between the host and the experts in Bahasa Indonesia. The maximum length of each episode was around 20–30 minutes, depending on the materials discussed. The topics of discussion were decided based on the observation of current concerns found in the local area of East Java or at the national level. In addition, the topics must have an urgency and be approved by the head of *UPT Laboratorium Gizi*.

During the designing stage, the research and development group of NutriPodcast was responsible for generating topics and ideas for the conversation. Furthermore, the producer of NutriPodcast communicated the topics and the ideas to be discussed to the experts and the host. The content of the topic, including scientific materials, was made familiar to both the expert and the host before the podcast recording. Since nutrition is typically related to food and diet, it was considered that the use of a video illustration in the podcast could help exhibit the food of certain diets being discussed. The video illustration might help the experts better explain the topics. A unit studio room was provided to facilitate the recording activity, and it was ideally expected to be impermeable.

2.2.2. Editing stage

Once the recording (both audio and video) had been done, these materials entered the editing process, which integrated technical and technological aspects. The technical aspects of the podcast, including voice, video, and music, require editing. NutriPodcast laid stress on the use of the natural voice of the participants who are encouraged to speak with enthusiasm and engagement about the topic instead of reading. The video element of the podcast was shot using two high-definition camera equipments to guarantee its playback quality from an alternate angle. Furthermore, the application of music was minimum and only accounted for the music in the opening session of the podcast.

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The technological aspect comprised both hardware and software equipment to edit the elements described in the technological aspects. A laptop (with the specification of Intel core i5 9th generation processor, Nvidia GeForce GTX, and 512 GB SSD memory) was the only hardware required in the NutriPodcast editing stage. Audacity software was used to rearrange the voice input, while Adobe Premiere Pro was used for editing the video and incorporating both audio-video files into the final podcast product. The editing of the podcast itself was directed by untrained staff since the types of software (Audacity and Adobe Premiere Pro) used are easy to understand. Moreover, the podcast did not require any specific and advanced audio-visual editing.

2.2.3. Distribution stage

The final stage of NutriPodcast development was the distribution stage, which allows people to watch or listen to the materials. Since NutriPodcast aimed to reach as many people as possible, it is important to consider what platform will be used to upload the materials. YouTube was chosen to distribute the episodes of NutriPodcast. The link to the NutriPodcast playlist is available on the "*UPT Laboratorium Gizi*" YouTube channel (link: https://www.youtube.com/playlist?list=PLlkDxeMF2sI_8hYM4aYC6JlydUb2k_ceA).

2.3. Assessing NutriPodcast engagement

With the advancement in technology, various digital platforms have provided comprehensive analytics information that can be downloaded online. Information derived from YouTube Studio's analytics feature was used to identify the engagement of NutriPodcast. The engagement variables consisted of view numbers, devices used to watch, and viewers' demographic data from November 1, 2020, (when the first episode was launched) to June 8, 2021. The data is presented descriptively in this report.

3. Results and discussion

Podcasts are recognized to be effective tools in learning and are widely used for higher education, entertainment, and health work (Nwosu et al., 2017; Yeh, 2014). Lately, podcasts are being studied empirically for nutrition education in the general community.

https://doi.org/10.7454/ajce.v6i1.1146

This study aims to understand how video podcasts are utilized in nutrition education and how they can engage viewers from the general community.

3.1. NutriPodcast development

16 episodes were developed during the first five months (from November 2020 to April 2021) of the NutriPodcast program. These episodes consisted of nine topics. Several topics were divided into two episodes, depending on the length of the discussion (since the maximum duration was 20–30 minutes per episode). Although there is no specific method to develop a podcast, the methodology used to develop NutriPodcast was according to Fernandez et al. (2015) as depicted in Figure 1. Discussion regarding each of the methodology stages is described below.

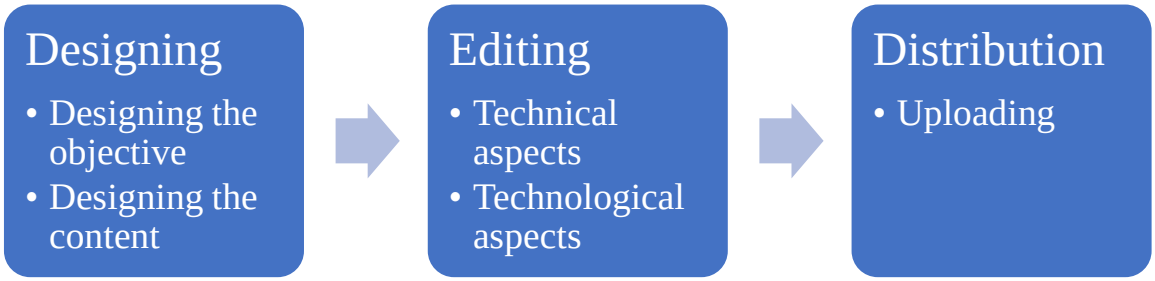

Figure 1. The three stages of NutriPodcast development: Designing, editing, and distribution

3.1.1. Designing stage

The designing stage of a podcast is considerably important to determine its success and audience acceptability. Fernandez et al. (2015) suggested that the design concept could consider the features of the podcast: the style, the length, and the type of media used. The information on podcast design is shown in Table 1.

Table 1. Features of the podcast design

No	Features	Results
1.	Style	Informal
2.	Length	Long (20–30 minutes)

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No	Features	Results
3.	Media	Video podcast

Style refers to the degree of formality the podcast adopts (Fernandez et al., 2015). As depicted in Table 1, NutriPodcast incorporated an informal style, with a 20–30-minute duration for each episode. In every episode, a host led the conversation, with one or two experts as the interviewees. The NutriPodcast conversation discussed current problems and shared advice on a specific nutrition topic. This podcast incorporated a video in every episode. Thus, this type of podcast can be classified as a video podcast.

There are different perspectives to discerning an informal style from a formal style. The informal style approach focuses on a holistic aim rather than a single capacity focus (for example, only cognitive focus). It is a learning style that is collaborative and based on experience/activity. Moreover, the informal style expands democracy and flexibility to deliver its learning message (Coffield et al., 2004).

It is believed that a sense of informality in the learning process is important. A previous qualitative study suggested that an informal learning environment was preferable (Edirisingha et al., 2007). In an informal conversation, the flexibility of adding humor can engender the familiarity of the audience with the host. Thus, it creates a sense of trust or credibility in the information given (Malecki et al., 2019). It was found that in an informal podcast, people are more likely to enjoy and engage in the conversation between the host and the interviewee rather than in a formal podcast with a single manuscript reading (Malecki et al., 2019).

NutriPodcast, which takes 20–30 minutes per episode, was considered a long podcast (Carvalho et al., 2009). The length of the video podcast has been associated with the successful learning output in previous studies. Several researchers have recommended that podcast length ought not to be longer than 5 minutes to be effective (Chan et al., 2006; Li, 2010), while others have stated that the length should be no longer than 5–10 minutes (Shahid & Ali, 2017). It was found that 28% of the audience listened to the podcast beyond 1 minute and dropped off after 10 minutes. Even though a 30-minute podcast might cause the content of the conversation to have less useful details and facts, this duration is still good for a podcast delivering general opinions and arguments (Carvalho et al., 2009). Another study carried out by Cosimini et al. (2017)

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implied that according to their pilot medical podcast survey, 15–20 minutes was considered to be the optimal length compared with podcasts that take 5–15 minutes.

Unfortunately, the length preference for the present video podcast was not studied. The data on this video podcast, which effectively improved the audience's knowledge regarding the topic delivered, could not be shown. Therefore, further works to confirm the audience's preference concerning the length of NutriPodcast and to evaluate its performance beyond the statistical view numbers are encouraged. In addition, it is important to ensure that the length of future NutriPodcast does not exceed the optimal 10 minutes as indicated in the literature.

The third feature of NutriPodcast was the use of video. The video displayed the conversation between the host and the expert on some particular topics. Depending on the topic, some episodes of NutriPodcast showed a display of the food menu to demonstrate the variation and the portion of food. In such cases, visual supplementation by using a video podcast is necessary. A video podcast ensures more interaction, is richer in media, and is more flexible in meeting the learner's needs compared to an audio podcast. Video podcasts enable the audience to view the visual presentation and hear information simultaneously, which might improve the learning outcomes (Kalludi et al., 2015). However, it must be considered that video podcasts might have disadvantages related to technical difficulties and convenience (Kalludi et al., 2015; Kay, 2012).

3.1.2. Editing stage

The editing process of NutriPodcast consisted of two aspects: technical and technological aspects. In the technical aspect, voice, video, and sound/music might be edited according to the prior idea about the NutriPodcast design. Since voice is a fundamental asset in a podcast, the editing process might enhance the voice as clearly as possible (Fernandez et al., 2015). It might consider where the podcast can be uploaded as well. For instance, as YouTube is the best platform to upload video podcasts, the video editing process might consider YouTube criteria, such as using a 16:9 screen ratio. The utilization of music background/sound effects was minimal in this podcast. A short duration of music was only performed in the opening session, and no music background was found during the core content.

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The second aspect discussed in the editing stage was the technological aspect, which mainly related to software and hardware tools. With the advancement in technology, various kinds of software are available for video podcast editing, which are easy to operate. In the case of NutriPodcast development, Adobe Premier Pro was chosen to edit the videos because of its complete features. The video was incorporated with the audio, which had been edited by using Audacity, in a unit of a compatible laptop (hardware).

3.1.3. Distribution stage

The last stage of podcast development is distribution. As a video web recording, YouTube was the most favored platform for delivering NutriPodcast online. Today, YouTube is the most well-known webpage for sharing video data on the Internet (Madathil et al., 2015). It was found that in 2020, almost 88% of the 171 million web clients in Indonesia enjoyed the YouTube platform (Ramadhani et al., 2020). Besides having many viewers, YouTube additionally provides various beneficial training for free and acts as a video library (Kay, 2012). Simultaneously, YouTube empowers cooperation between the viewers and the creator through the comment section, and the like button allows viewers to give a rating on the video (Beautemps & Bresges, 2021).

NutriPodcast is an innovation created to provide the general Indonesians, especially those who live in East Java Province, with nutrition education through YouTube. To direct the target audience to the platform, it is critical to propel the video podcast to become well-known on YouTube. It is recommended to increase video ubiquity by considering a few factors: the number of likes, channel efficiency, and video age (Velho et al., 2020).

3.2. NutriPodcast engagement

As indicated by the analysis of the YouTube analytics tool, which was collected toward the beginning of June 2021, the aggregate number of times NutriPodcast was played was 4,263. This outcome was viewed as a positive reaction from the crowd and significantly contrasted with other medical and health podcasts. For instance, another medical and health podcast called AmiPal Podcast, which comprised 20 episodes of palliative consideration data for clinical society in the United Kingdom, was played

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3,306 times during one year (Nwosu et al., 2017). In Indonesia, studies and reviews on nutrition and health educational podcasts are still scant. Therefore, this study was unable to compare the commitment of NutriPodcast with any other nutrition podcast in Indonesia. This study proposes future examinations in the Indonesian context that concentrate on this area since podcasts are promising as futuristic and innovative media for community education regarding nutrition and health, especially during pandemics when conventional outreach method is not feasible.

This research strongly confirmed that NutriPodcast is an online nutrition media that is accessed by various people in Indonesia. One of the reasons for the growing popularity of podcasts is the increasing number of mobile and computer devices owned by people, which permitted the local people to look for, watch, and share the digital recording materials with their associates and family (Balls-Berry et al., 2018). In addition, it was reported that most Indonesians (60%) watched video content on the Internet to search for the latest information (IDN, 2020). Web clients are dynamic data searchers and potential viewers of the NutriPodcast program (Kivits, 2009).

The fad diet episode became the most played topic in NutriPodcast with 1,037 views, followed by the balanced diet topic, with 930 views (see Table 2). The findings of this study showed that the episodes with the topics of nutrition, exercise, and weight control were the most popular in the NutriPodcast programs. This finding was in accordance with a past examination conducted in the United States, which proposed that among all clinical subjects, the weight control material was one of the top interests of health seekers on the Internet (Fox & Rainie, 2002).

Table 2. Topics Discussed in NutriPodcast

No	Topic	Play	Date Uploaded
1.	Nutripreneur and food business ideas during the pandemic	441	Nov. 2020
2.	Balanced diet	930	Dec. 2020
3.	Anemia among teenagers and food to prevent anemia	452	Feb. 2021
4.	Nutritionists' roles during the pandemic and diet for COVID-19 patients	454	Feb. 2021

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No	Topic	Play	Date Uploaded
5.	Communication skills for nutritionists	343	Feb. 2021
6.	Experiencing COVID-19 story	454	March 2021
7.	The fad diet	1,037	April 2021
8.	Healthy snacking in café	189	April 2021
9.	Breakfast recipes and ideas during Ramadhan	138	April 2021

The demographic data of NutriPodcast viewers were dissected to investigate the podcast's dissemination (see Table 3). 87.1% of the viewers used a smartphone to watch NutriPodcast. This finding is consistent with another major study conducted in Germany that identified the smartphone as the dominating gadget for watching video podcasts, followed by the personal computer (PC) (Beautemps & Bresges, 2021).

More than half of NutriPodcast viewers were people from the 25–34 age group (55.2%). The 18–24 age group (27.3%) made up the second-largest segment of NutriPodcast viewers, followed by the 25–44 age group (17.5%). These findings showed that grown-ups or individuals aged 25–34 were the dominating NutriPodcast viewers. The finding was consistent with different reports gathered from America and the United Kingdom (Buzzprout, 2021).

The number of female viewers (51.5%) was marginally higher than male viewers (48.5%). This outcome demonstrated a concurrence with past investigations, confirming that women are bound to seek health information more than men (Hill & Nelson, 2011; Li et al., 2016). Parenting factors might help explain this phenomenon. Parenting is a typical gender activity and is more linked to women because they tend to play the role of a gatekeeper of their family's health (Rowley et al., 2017; Stern et al., 2012).

Table 3. The Demographic Data of NutriPodcast Viewers

No	Items	Category	Percentage
1.	Devices used for viewing the podcast	Smartphone	87.1%
		Personal computer (PC)	12.1%
		Tablet	0.5%
		Smart television	0.3%
2.	Age	< 18 years old	0%

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No	Items	Category	Percentage
		18–24 years old	27.3%
		25–34 years old	55.2%
		35–44 years old	17.5%
		> 44 years old	0%
3.	Gender	Women	51.5%
		Men	48.5%

In summary, this present study provides important information about the methodology and strategy to develop a model of video podcast as a part of the nutrition engagement program, especially when face-to-face outreach is not feasible during the pandemic. Reviews related to podcasts for a community outreach service, especially in the healthcare field for general groups of people, are still scarce. NutriPodcast as the first video podcast launched by the East Java provincial government reached a huge number of Indonesian viewers on the YouTube platform within months after it was uploaded. The number of viewers and engagement will keep increasing over time as long as the video podcasts are available on YouTube.

Various stakeholders, ranging from governmental institutions to private organizations, can scale up the video podcast with the goal of community capacity building. The development of skills and knowledge in a community, which allows them to enhance their health, is referred to as capacity building. Common capacity-building approaches include online learning, guidance material distribution, and technical assistance (Decorby-Watson et al., 2018). Video podcasts can help with the transfer of technical support, information, and virtual consultations in this regard.

The limitation of this paper is that it only measures the number of NutriPodcast viewership without collecting information on how effective the video podcasts were in improving the nutrition knowledge of their audience. This study recommends future attempts at confirming the effectiveness of video podcasts in improving individuals' nutrition knowledge. The effectiveness of video podcasts can then be compared with the results of conventional outreach methods, such as face-to-face outreach programs.

https://doi.org/10.7454/ajce.v6i1.1146

4. Conclusion

Video podcasts have been used for various purposes in specific groups, for instance, to improve students' academic performance in literature and medical subjects. However, their use for health outreach targeted at the general population is unknown. NutriPodcast or "Nutritious Video Podcast" is the first video podcast developed to engage the community in East Java. In this paper, we demonstrated that a video podcast can be an innovative and promising method for health outreach strategy in the community. It can address the challenges in nutrition outreach delivery during the pandemic in Indonesia.

Moreover, it offers an opportunity to engage a large number of Indonesian people via YouTube, especially the adult group who have an interest in diet topics. The limitation of this research is the absence of an evaluation of its audience's knowledge and behavioral change. We recommend future research to confirm the effectiveness of video podcasts especially in increasing people's knowledge and bringing about health behavioral change when it is used in the health engagement program.

Author Contribution

The author carried out paper conceptualization, methodological framework, data collection, and data analysis. The same author also contributed to draft preparation and final manuscript revision.

Acknowledgment

The author would like to thank *UPT Laboratorium Gizi* for their kind permission to use the NutriPodcast data from their YouTube channel. The author is grateful to be involved in the NutriPodcast initiation and development, together with the members of *UPT Laboratorium Gizi*.

Funding

This research received no external funding.

Declaration of Conflicting Interest

There is no conflict of interest in this manuscript.

https://doi.org/10.7454/ajce.v6i1.1146

Short Biography

Lini Anisfatus Sholihah works as a lecturer in the Nutrition Study Program, State University of Surabaya. She had previously worked for seven years in *UPT Laboratorium Gizi Dinas Kesehatan Provinsi Jawa Timur.* She earned her Bachelor's degree in Nutrition from the University of Indonesia in 2013. In 2017, she received her master's degree in Human Nutrition, specializing in Nutritional Physiology and Health Status. She was awarded the Netherlands Fellowship Scholarship from the Dutch government for her master's study at Wageningen University & Research from 2015 to 2017.

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