ARTIBIOTICS: EXAMINING THE ROLES OF TWO ARTFORMS IN SUPPORTING COVID-19 PUBLIC HEALTH MEASURES IN LAGOS. DR. NWEKE, FLORENCE EWOMAZINO.

ABSTRACT

Despite the initial uproar in the conventional and social media which the COVID-19 pandemic elicited, attention was not paid to various coping mechanisms available for restoring sanity and calmness to those who had been psycho-emotionally affected directly or indirectlyby the COVID-19 lockdowns. Given their information-dissemination capacity, music and animated cartoons played a crucial role in propagating the message of prevention of the virus. Information on how music helped in creating awareness during the previous outbreak in Nigeria such as the Ebola virus was elicited from the respondents in this study. The study adopted the methods of discourse analysis and Focus Group Discussions. It was found that various art forms such as cartoons, films, literatures and music and so on. Music, as portrayed in this study, helped residents to be wary of the virus, through the messages from the jingles. This study found out that, the various measures meant to help reduced the spread of the COVID-19 pandemic were sung in the jingles. The Songs also raised the hopes of respondents by shifting their attention from disturbing news about the pandemic to music and visual images. The study recommends that, the arts (music, cartoons) should be introduced at all strata of the society as well as in the school curriculum as one of the tools useful for disaster preparedness/prevention.

Keywords: Music, Art forms, Cartoons, Animations, emotions

1.0 Introduction and Background to the Study

Making music arouses many people's emotions. As Perez et al. (2014) found, musical activity such as singing or listening to music provides multiple benefits to people of all ages. According to Cecil et al. (2003), "participation in a group musical ensemble yields musical, academic, psychological, and social benefits." In West Africa, communication and awareness infrastructure initiated during the 2013-2016 Ebola outbreak has been leveraged upon during the COVID-19 pandemic (Leach, 2020). Nweke (2020) cites the World Health Organisation's (WHO) report on the role music played in Liberia's efforts to contain the spread of Ebola in 2014. The West African country had been worst hit by the Ebola outbreak. Through music, Charles Yegbasought to create awareness about the virus by identifying symptoms of the disease such as headaches, diarrhea and vomiting; Yegba also identified measures taken to contain the disease. The song, as well its message, spread like wildfire in Liberia. Similarly, at New York University, music was used as an instrument in Public Health Education by Professor Carlos Chirinos-Espin, who developed the Africa Stop Ebola awareness campaign song (Nweke, 2020). In current times, some

residents have turned to social media platforms for updates on COVID-19, with many getting useful information there on howto take precautions against its spread.

This chapter focuses on theaudio and visual arts with particular reference to music and cartoon animations in creating awareness to the general public, particularly those living in slum and informal communities. The chapter presents instances and illustrations on how the arts helped residents in these areas cope during the COVID-19 pandemic. In this regard, the researcherscoined the word 'Artibiotics'. In the researchers' opinion, many people treated the virus with levity at the outset, leading to many avoidable deaths. The use of jingles and animated cartoons aired on radio and television, also spread on social media, served as a constant reminder to support the spread of the disease through adhering to public health messages.

The aim of this chapter is to examine the role of music and cartoon animations in coping with the COVID-19 pandemic in various communities. The objective is to examine the role of music and arts in helping residents to cope with the lockdown. Consequently, the chapter answers the question: 'What role didmusic and graphic arts play in enabling residents cope with the lockdown?'

2.0 Literature Review

Presenting specific evidence in content to people of all levels of literacy is crucial (Peters, 2017). Wang (2020) asserts that all media (print and electronic), such asnewspapers, magazines, television, radio, billboards, phones and the Internet are instrumental in a war against the COVID-19 pandemic. Wang (2020) further asserts that, "these media have provided updates on the number of infections, fatalities, recoveries, emergency regulations, and policies especially as it pertains to the COVID-19 pandemic.

Nevertheless, society is full of people who disproportionately spread negative information about growing or current issues, as reported by Baumeister et al. (2001) as well as Tierney and Baumeister (2019). According to Motta et al. (2020),to create more awareness about the urgency of the COVID-19 situation,more rigid measures were encouraged in many cities. Moreover, as Frenkel et al. (2020) reported, "individuals who informed themselves mainly through newspapers have a higher degree of knowledge than those who used television and social media." As such,

people tend to get wary about current issues through multiple mediaoutlets. In Nigeria, information about COVID-19 prevention measures was disseminated extensively via social media platforms. The present study identifies some of these outlets, focusing on 'two art forms', hence the coinage 'artibiotics.

Kearns (2018) used the word 'artibiotics' to communicate a clear message that emotionally resonates with viewers, based on the artistic forms of music, painting, stylisation or a combination of different art forms. Miranda (2018) also adds that

"the rules of music are indeed arbitrary' claimed several codes representing the realms of genetics and music, are vital for information communication."

Outlets for Creating Awareness during the COVID-19 Lockdown

Sloboda further claimed that "music can and does have important psychological benefits. Not only does engagement with music seem inherently pleasurable when used for essentially therapeutic purposes rather, but strong and valued emotions also seem to be at the core of music engagement" (Sloboda, 1992). Camics (2008) reports that an emerging set of studies has begun to explore the role of visual art, music, dance, storytelling, theatre/drama in improving lay understandings of HIV/AIDS, malaria, cholera and mental illness, etc. As well as addressing general health and well-being, these studies engaging the use of arts belong to a multidisciplinary field that integrates artistic skills in interventions for improving healthcare at the broadest level – from health promotion, illness management to policy development.

Ayedee et al. (2020) note that human beings are emotionally attached to electronic media and depend on them for daily information on COVID-19. Sarna and Norstrom (2021) report that the Internet and social media became outlets for people's reactions to unfoldingevents, especially those related to the COVID-19 lockdown. One way in which people participated was by creating and sharing memes as an expression of digital participatory culture. AsHoffman et al. (2020) observed, during the lockdown, cartoons performed various functions ranging from purely commercial to psychological ones.

For Kearns et al. (2020),"Comics became a popular medium for exploring COVID-19-related topics, helping to rapidly bring public health terminology like 'social distancing' into common

parlance and understanding." Moreover, in the field of healthcare, illustrating patient resources with pictures, including cartoons and comics, was shown to enhance patient understanding, particularly for those experiencing communication barriers related to education, literacy, health literacy, language, and culture (Austin, Matlack, Dunn, Kesler&Brown[1995]; Brotherstone, Miles, Robb, Atkin& Wardle [2006]; Delp& Jones [1996]; Houts, Doak, Doak&Loscalzo[2006]; Murphy et al. [2007]; Tjiam et al. [2013]).

Aikins (2020) posits that artists translate COVID-19 information in ways that connect emotionally, create social awareness and lay the foundations for public understanding. Some other research findings offer sociopolitical critique and advocate social protection for poor communities. Ananta and Devi (2020) noted that "In the course of the Covid-19 Lockdown, students' learning performance, especially at the elementary level, significantly increased due to watching animated and gag cartoon-based intervention." An animated cartoon, when deployed in teaching students, encourages them to learn any complicated subject matter quickly (Mtebe&Twaakyondo[2012]), in addition to catching the attention of studentswith Attention Deficit and Hyperactive Disorder through the motion and images portrayed (Govindaraj, 2012). Muthuchamyand Arunraj (2013) found that learning via a "cartoon has a significant positive effect on children as it creates a humorous environment where they can learn contents easily, respond to any queries, enjoy classroom situation, react to any stimuli whether it may be alone or with friends in a small or large group." To be sure, learning with animated cartoons became a new normal during the COVID-19 pandemic lockdown, as the researchers found.

Marc (2021) added a new dimension of using documents to make the virus vivid and the pandemic an experienced reality. Thus, the COVID-19 signage, which materializes the disease and pandemic into tangible items that individuals can relate with and see daily, has come to mediate social life and articulate COVID-19 during this great health crisisMoveable images that attempted to send information about a story or a recurring issue usually shot in rapid successions with a sequence of drawings that seem to move and change when the sequence is shown as an animated cartoon (Oyero and Oyesomi, 2014). Onuora et al. (2020) examined 470 social media users who were exposed to animated cartoons on YouTube. Onuora et al. (2020) found that "the reality of the COVID-19 was the greatest factor in predicting the effectiveness of YouTube animated cartoons on health behavior; this was regarded important because of the danger the

COVID-19 pandemic posed on human health". Hence, every avenue for creating awareness on the preventive measures was taken seriously.

Venkateswaran (2020) asserts that "Coronavirus prevention efforts both protect the people who engage in them and promote the welfare of society," adding that "often not facts and information, but emotions drive the risk perceptions," hence the fact that emotions dictate how people respond to situations around them. Boni (2016:13) noted that the main strategies to elicit emotional responses are musical language components, hence his view that musical language is the ultimate form of information provision. Yatindra (2020) explores the replacement of accurate human visuals by animated cartoons used by Indian rappers in their videos. According to Yatindra, "this Covid-19 pandemic brought in the newer concept where no crew, but an individual or a smaller team had been the production team for cartoonization of the rap videos." Yatindra also noted thathip-pop culture became famous as an instrument of creating awareness during the COVID-19 pandemic lockdown, making music relevant in creating awareness.

Traditional music with musical language components such as rhythm, melody and harmony is used in experimenting. As Lim and Lee (2014) reported after a music therapy session, depression scores were noted to decrease. Identical results were reported by Khil Tae-sook and Chan Suk-jin (2012) and Hsu and Lai (2004) that music brings out emotions in people, eventually leading to behavioural changes (1999). Music releases oppressed feelings and grants opportunities to express feelings in self. Consequently, the various roles played by these media and art forms created an opportunity to adopt it in our study on COVID-19 adaptation strategies. The researchers created musical jingles in the local dialects and also in a common Nigerian language, i.e.NigerianPidgin English. This was done to ensure that the research dissemination could be made accessible to people at the grassroots.

Theoretical Framework

The Pharmaceutical Model by Sloboda (2006) is relevant for this chapter. This chapter perceives the arts, i.e. music and cartoon animations, as antibiotics, especially in terms of its effect on listeners. As such, music is conceived as a pharmaceutical product that is capable of stimulating perceptual, cognitive and emotional responses in a listener. Sloboda (2006), a major proponent of the pharmaceutical model, describes music as a catalyst that influences individuals and groups of

people. In most cases the choice of music is solely dependent on its function. In this case the musical jingles became an elixir that helped sensitize the people on safety measures.

During the lockdowns, music and animated cartoons literally became drugs for residents of multitenanted housing, as the word cloud (see Figure 1) findings show. Those who obeyed government regulations reported enjoying emotional relief from prolonged exposure to music and cartoon animations viewed via the media and social media platforms. Sloboda (2006) reports that there is considerable psychological evidence to show that we remember highly emotionally charged events uniquely, with music tending to shape the body's emotional response to music.

Method

This chapter reports on the findings from a number of data collection processes.

The study was conducted between July 2020 and March 2021, and this chapter reports on findings relevant to the role of music in the various data collection processes utilized. These are:

- (i) Radio-phone in programmes
- (ii) On-line survey
- (iii) Focus Group Discussion

Findings

Radio-Phone in Programmes

In compliance to public health advisory at the time of data collection, information was collected from the public through radio-call in programmes and virtual focus group discussion. The radio stations also served to solicit information from respondents about how they coping with pandemic and secondly, to broadcast the research findings which had been packaged as jingles. Discourse Analysis was used to interpret the data.

On radio, respondents called in to a special programme put up for the project. The call-in programmes allowed interactions between presenters and callers, who made up the study population. The languages of expression were Nigeria's most widely used languages: Nigerian Pidgin English, Yoruba, Igbo, Hausa, and English.

The sampling method for selecting the radio stations was purposive. The selected stations were Bond FM 92.9, which broadcasts in the three Nigerian languages of Yoruba, Igbo, and Hausa; Radio Nigeria One 103.5 FM; and Women FM 91.7. The study engaged the same radio stations

for the broadcast of the research finding dissemination jingles, in addition to Metro FM 97.7FM, Wazobia FM 95.1FM and Nigeria Info 99.3FM.

The study categorized the research objectives into six questions simplified into open-ended questions for ease of callers' understanding. Each question was addressed for 15minutes, three times a week. The radio call-in programme lasted for three weeks for BOND FM and Radio Nigeria 1 and the English broadcast lasted for two weeks via the Women FM.

The broadcast plan is found in appendix 1.

The researchers thereafter created jingles and cartoon animations from the information elicited from the public on awareness about the pandemic.

Online Survey

An online survey was also carried out, which elicited responses on the role of music in coping with the demands of the lockdown. Findings were analysed using descriptive statistics.

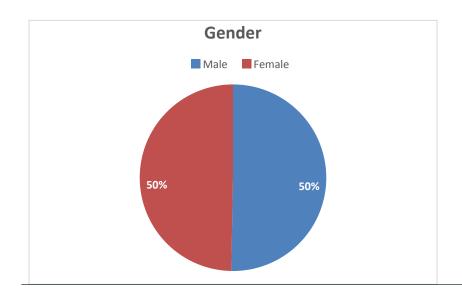


Figure 3.1:
Demographic
information
showing responses
from both Gender

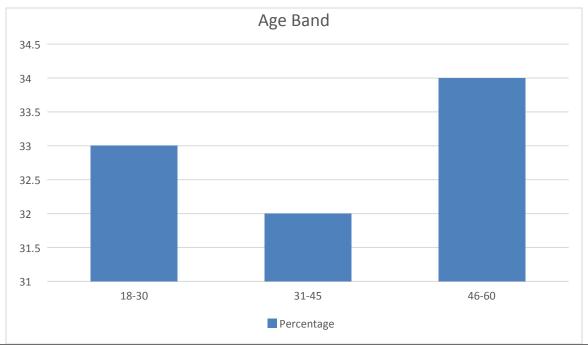


Figure 3.2: Respondents' Age band

Table 3.1: Educational level of respondents

	Frequency	Percent
Secondary	377	13.7
Undergraduate/OND/Technical School	378	13.8
BSc/HND	403	14.7
Masters	428	15.6
PhD	401	14.6
None	391	14.2
Others	369	13.4
Total	2747	100.0

Table 3.2 We heard about COVID-19 through TV programmes

	Frequency	Percent
TV programmes	1411	7.6
radio programmes	1355	7.3
Jingles	1317	7.1
Music	1350	7.3
Newspaper reports	1356	7.3
Twitter	1320	7.1
Facebook	1320	7.1

Instagram	1318	7.1
LinkedIn	1275	6.9
WhatsApp	1326	7.1
words of mouth	1344	7.2
Cartoons	1274	6.9
Animation	1279	6.9
other source	1321	7.1
Total	18566	100.0

Table 3.3: Our current source of information on COVID-19 is through

	Frequency	Percent
TV programmes	1420	7.6
Radio programmes	1341	7.1
Jingles	1333	7.1
Music	1295	6.9
Newspaper reports	1376	7.3
Twitter	1352	7.2
Facebook	1393	7.4
Instagram	1313	7.0
LinkedIn	1311	7.0
WhatsApp	1420	7.6
Word of mouth	1341	7.1
Cartoons	1264	6.7
Animation	1337	7.1
other sources	1288	6.9
Total	18784	100.0

Table 3.4: How frequently do you seek information on COVID-19?

	Frequency	Percent
Highly frequently (i.e every day)	746	27.2
Fairly frequently (i.e at least once a week)	716	26.1
Less frequent (i.e at least once a month)	672	24.5
None (i.e I don't seek out information on	608	22.2
COVID-19)		
Total	2742	100.0

Table 3.5: Has music played any role in helping you cope with the pandemic?

	Frequency	Percent
No	672	24.5
Yes	740	27.0
I don't know	654	23.9
I don't listen to music	676	24.7
Total	2742	100.0

The question on the role of music during the lockdown got a total number of 430 votes, with the 'Yes' option having the highest percentage of votes at 68.1%, while 'I don't know' has 13.7% votes, 'No' 12.1% and 'I don't listen to music' has 6% votes of the total poll percentage. Further manual analysis of the responses of those who chose 'Yes' was done, with the wordcloud shown below.



Figure 3.3 Word cloud showing the roles of music during the COVID-19 pandemic lockdown

The word cloud above is a pictorial presentation of respondents' perceptions on the role of music during the pandemic. The words 'music', 'helped' and 'mind' are most prominent, followed by the word 'whenever' and others such as 'boredom', hope' and 'away'. 'Nerves' and 'calm' are also visibly prominent.

Manual textual analysis showed that music is associated with these words in various contexts. Some of the respondents stated as follows:

'Music has **helped** to relieve the stress of being restricted to the house' (respondent 52)

'...**Helped** me clear my **mind**' (respondent 16)

'Sometimes it takes away my **mind** from the negative side of COVID-19 pandemic and I'm lost in that exciting feeling, **whenever** my favourite music is on' (respondent 65)

'Keeping **hopes** alive positively knowing that the pandemic is not a death sentence' (respondent 46)

'The role of focusing my **mind** on things that are more eternal knowing full well that this phase too shall pass away' (respondent 71)

'Calming my nerves' (respondent 6)

All of these accounts indicate the importance of the role of music as a coping strategy during the pandemic.

Table 3.6: Have you seen any cartoon or animation that changed your perception of COVID-19?

	Frequency	Percent
No	1356	49.4
Yes	1391	50.6
Total	2747	100.0

Table 3.7: If yes, where did you see it? (e.g. Facebook, etc.)

	Frequency	Percent
Facebook	84	6.0
Twitter	251	18.1
WhatsApp	261	18.8
YouTube	4	0.3
TV programmes/advert	667	48.0
Social Media	69	5.0
Instagram	10	0.7
Google	8	0.6
Cartoon Network	36	2.6

^{&#}x27;Therapeutic and killing **boredom**' (respondent 73)

Total 1390 100.0

The COVID-19 pandemic, though very devastating to the health sector, appears to have brought attention to the cultural sector. As noted by Jeannotte(2021), Kapoor and Kaufman (2020), some individuals, firms and countries displayed resilience and creative responses in coping with pressing demands on healthcare and people's sanity. As at December 2020, the COVID-19 pandemic had resulted in 1.4 million deaths and over 58 million infections worldwide (Dong et al., 2020).

Focus Group Discussion

Finally, a focus group discussion took place on December 16, 2020; it involved 12 residents from six low-income communities in Lagos State. The interactions was a two hour virtual engagement. Participants explained how members of their communities –mainly low-income earners – had been coping with the pandemic. They also highlighted safe-keeping actions undertaken by residents of their communities and those of nearby ones. The respondents emphasized the sensitizing role of music and the positive vibes it gave them during the COVID-19 pandemic lockdown.

Music and Arts as Dissemination Tools

The animated cartoons were used as dissemination tools. With findings from the study summarized into a one-minute strip, the productions were aired by the project's media partner on two popular television stations (African Independent Television (AIT) and Television Continental (TVC). It was also released on social media platforms of the Centre for Housing and Sustainable Development as well as the co-Investigators' platforms. It was interesting to note that it generated quite a following.

The dissemination jingle broadcasts on radio were also done in the four major Nigerian languages. In terms of content, the jingles highlighted the preventive measures against COVID-19 infection and was specially produced to address issues of prevention on the home-front, the public health messages on proper use of face-masks was also emphasized as was the risk of accepting visitors during the lockdown. These emanated from the findings of other work-packages in the project. The messages contained in the jingles were clear, concise and persuasive. The radio jingle had the

instructive statement "Make you dey wash your hands.... To kick corona out", with the English version being "Life is for the living.... So you stay alive." The last jingle, composed in the traditional spoken word chant Yoruba language (*ewi*), was also simple and persuasive.

Audiovisual materials, flyers, and posters were distributed and posted at strategic places in Lagos state. Community research partners who were domiciled in the communities themselves were engaged in the publicity process, playing the jingles on public address systems mounted on vehicles driven around the densely populated selected communities.

Conclusion and Policy Recommendation

Many residents of multi-tenanted housing in Lagos continue to bear the impact of the six-week lockdown of 2020. Although the lockdown allowed people ample time with their family, many families experienced significant loss of income, increased business instability, emotional stress, increased expenditure on food, as well as restiveness by homebound children and young adults. However, it was found that music generally served as a crucial tool of enlightenment, especially in awakening consciousness on COVID-19 preventive measures. Consequently, the findings of this study should benefit the international community, as it provides tools and strategies on how community spread of COVID-19 might be contained in other African cities facing similar challenges as Lagos. It is quite significant that the research is grounded in two SDGs, viz: SDG 11.1, which isaccess to adequate, affordable and safe housing; and SDG 6, which is equitable access to water and sanitation. In the light of the study's findings, it is suggested that there is need for more concerted actions towards realisingthose goals. These findings, which come from a humanities perspective, are indeed reflective of the sort of grounded and creative solutions required in this part of the world.

Residents of multi-tenanted housing in low income communities readily confirmed that music and cartoon animations played a major role in sensitising them on the COVID-19 pandemic. They particularly reported that music effectively articulated the need for hand-washing, using hand sanitisers and maintaining social distancing; moreover, the cartoon animation produced during this research project also contributed significantly to spreading the message on the pandemic. The respondents affirmed that music brings a positive vibe and that positive emotions were displayed

through different emotions stimulated by the music, especially in a situation where the message was translated in the local dialect, the introduction of the jingles in different local languages helped the messages get to the grassroots, particularly, the illiterates. Using these local dialect for public health messaging ensures that, it is understood and accessible by the people in general.

ACKNOWLEDGEMENTS

The authors gratefully acknowledge the support of the Arts and Humanities Research Council (AHRC). Data used in this chapter was from the research project entitled 'A Study of COVID-19 Adaptation Strategies for Residents of Multi-Tenanted Housing in Lagos, which was funded by the Arts and Humanities Research Council (AHRC) of the UK Research and Innovation (UKRI) Councils under the "AHRC GCRF URGENCY GRANTS".

References

Aikins, A. D. (2020). 'Colonial Virus'? Creative Arts and Public Understanding of COVID-19 in Ghana. Journal of the British Academy. 8 (401-417).

Ananta, K.J and Devi. J. (2020). Lockdown Area of COVID-19: How Does Cartoon Based E-Content Effect Learning Performance of Indian Elementary School Students with ADHD. *The Online Journal of Distance Education and E-Learning*, 8(4).

Austin, P.E., Matlack, R., Dunn, K.A., Kesler, C., & Brown, C.K. (1995). Discharge instructions: Do illustrations help our patients understand them? *Annals of Emergency Medicine*, 25, 317–320. doi:10.1016/S0196-0644(95)70286-5

Ayedee, N. and M. Sanjay, Role of Media (Television) in Creating a Positive Atmosphere in COVID-19 during Lockdown in India (May 19, 2020). Available at SSRN: https://ssrn.com/abstract=3605514 or http://dx.doi.org/10.2139/ssrn.3605514.

Baumeister, R. F., Bratslavsky, E., Finkenauer, C., and Vohs, K. D. (2001). Bad is stronger than good. Rev. Gen. Psychol. 5, 323–370.doi: 10.1037/1089-2680.5.4. 323.

Boni, C.A. (2016). Music Therapy for Older People. Studies on the Projects in Ticino (Switzerland). Nordic Journal of Music Therapy. Supplement, Volume 25. 13-13. Database: CINAHL Complete.

Brotherstone, H., Miles, A., Robb, K.A., Atkin, W., & Wardle, J. (2006). The impact of illustrations on public understanding of the aim of cancer screening. *Patient Education and Counseling*, 63, 328–335. doi:10.1016/j.pec.2006.03.016

Camic, P. M. (2008), 'Playing in the Mud. Health Psychology, the Arts and Creative Approaches to Health Care', Journal of Health Psychology, 13(2): 287–98. https://doi.org/10.1177/1359105307086698.

Cucchiarini, V.; L. Caravona; L.M. Federico; L. Perlino& R. Viale (2021). Behavioral Changes After the COVID-19 Lockdown in Italy. Frontiers in Psychology. Original Research. 12.

Delp, C.& Jones, J. (1996). Communicating information to patients: The use of cartoon illustrations to improve comprehension of instructions. *Academic Emergency Medicine*, 3, 264–270. doi:10.1111/j.1553-2712.1996.tb03431.x

Frenkel, S., Alba, D., and Zhong, R. (2020). Surge of Virus Misinformation Stumps Facebook and Twitter. New York, NY: The New York Times

Govindaraj, S. (2017). Animated Learning Package of Mathematical Concepts for students with Attention Deficit Hyperactive Disorder. Unpublished thesis under Alagappa University, 1-139.

Hoffman, Z. H.; Ek, Kenney; JM, Merriman (2020). COVID-19 Pandemic and Lockdown Through the Eyes of a Cartoonist. Cambridge: Cambridge University Press.

Houts, P.S., Doak, C.C., Doak, L.G., & Loscalzo, M.J. (2006). The role of pictures in improving health communication: A review of research on attention, comprehension, recall, and adherence. *Patient Education and Counseling*, 61, 173–190. doi:10.1016/j.pec.2005.05.004 [Crossref], [PubMed], [Web of Science ®],

Kearns, C. (2018). Artibiotics: The Medical Illustrations of Dr. Cilein. Journal of Visual Communication in Medicine. 41(3) 125-132. Taylor & Francis.

Kearns, Cilien; Nethmi Kearns; Irene, Braithwaite; Nick Shortt; Allie Eathorne; Alex Semprini& Richard Beasley (2020). Using Comic and Curiosity to Drive Pandemic Research on a National Scale. JournL OF Visual Communication in Medicine. Taylor and Francis online. https://doi.org/10.1080/17453054.2020.1823206.

Lim Im, Mi & Lee InJeong (2014). "Effects of Art & Music Therapy on Depression and Cognitive Function of the Elderly." Technology & Health Care Volume 22. 453-458. DOI 10.3233/THC. 140803. IOS Press.

Marc, R.H.(2021). The Non-Pharmaceutical Interventionist (NPI) Signs of the Corona virus Pandemic: A Documentary Typology and Case Study of COVID-19 Signage. Journal of Documentation.

Miranda, ER (2018). Artibiotics: An Artificial Biology Musicak Experiment. University of Plymouth Pearl. Pearl.plymouth.ac.uk/handel/100.26.1/2714

Motta Zanin, G., Gentile, E., Parisi, A., and Spasiano, D. (2020). A preliminary evaluation of the public risk perception related to the COVID-19 health emergency in Italy. Int. J. Environ. Res. Public Health 17:3024. doi: 10.3390/ijerph17093024.

Mtebe, J. & Twaakyondo, H. (2012). Animations effective tools for teaching computer science courses in developing countries. International Journal of Digital Information and Wireless, 2(2), 202 207. Muthuchamy, I, & Arunraj, T. (2013). Cartoon a novel way to ensure student involvement on learning. Journal of Multidisciplinary Scientific Research, 1(3), 15-17. Available Online: http://jmsr.rstpublishers.com/

Murphy, D.A., Hoffman, D., Seage, G.R., Belzer, M., Xu, J., Durako, S.J., & Geiger, M., Adolescent Trials Network for HIV/AIDS Interventions (2007). Improving comprehension for HIV vaccine trial information among adolescents at risk of HIV. *AIDS Care*, 19, 42–51. doi:10.1080/09540120600680882.

Onuora, C.; N. T. Obasi; G.H. Ezeah; V.C.Gever (2020). Effect of Dramatized Health Messages: Modelling Predictors of the Impact of COVID-19 YouTube Animated Cartoons on Health Behavior of Social Media Users in Nigeria. Sage Journals International Sociology.

Oyero, O, Oyesomi, O (2014) Perceived influence of television cartoons on Nigerian children's social behaviour. Available at: www.ec.ubi.pt/ec/17/pdf/n17a05.pdf

Peters, E. (2017). "Overcoming innumeracy and the use of heuristics when communicating science," in The Oxford Handbook of the Science of Science Communication, eds K. H. Jamieson, D. Kahan, and D. A. Scheufele (Oxford: Oxford University Press), 389.

Sloboda, J. (2006). Exploring the Musical Mind. Oxford university Press inc. New York. P193.

Sloboda, J.A. (1992). Empirical Studies of Emotional Response to Music. In M. Riess-Jones and S.Holleran (Eds.) Cognitive Bases of Musical Communication. Washington, DC: American Psychological Association.

Sloboda, J.A. (2006). Exploring the musical mind. Cognition, Emotion, Ability, Function. Oxford University Press, UK. Pp357-358.

Tierney, J., and Baumeister, R. F. (2019). The Power of Bad: And How to Overcome It. Bristol: Allen Lane.

Tjiam, A.M., Holtslag, G., VanMinderhout, H.M., Simonsz-Tóth, B., Vermeulen-Jong, M.H.L., Borsboom, G.J.J.M., ... Simonsz, H.J. (2013). Randomised comparison of three tools for improving compliance with occlusion therapy: An educational cartoon story, a reward calendar, and an information leaflet for parents. *Graefes Archive for Clinical and Experimental Ophthalmology*, 251, 321–329. doi:10.1007/s00417-012-2107-4

Venkateswaran, T.V. (2020). Tale of Two Videos: Frame and Narative Structure Analysis of Two Covid-19 Communication Social Media Messages. NISCAIRCSIR, India. 08(1-2) Pp 18-37.

Yatindra, I. (2020). Lockdown: Indian Desi Rap's 'Cartoonization' A Study on the Inclusion of Cartoons in the Rap Video Songs During the COVID-19 Lockdown Period in India. EPRA. International Journal of Multidisciplinary Research (IJMR). 6(7). Pp 444-448. Journal DOI URL: https://doi.org/10.36713/epra2013.

The frequency of the radio programmes is shown below:

Radio Call-in Timetable

S/N	Date	Day	Time	Language	Radio Station & Remar Frequency k	
1	03/12/2020	Thursday	10:15 -	Yoruba	BOND FM	_
			10:30AM		92.9FM	
2	04//12/2020	Friday	3:15 –	Pidgin	Radio One	
			3:30PM		103.5FM	
3	04/12/2020	Friday	4:15 –	Hausa	BOND FM	
			4:30PM		92.9FM	
4	05/12/2020	Saturday	12:45 –	Igbo	BOND FM	
			1:00PM		92.9FM	
5	06/12/2020	Sunday	11:30 -	Yoruba	BOND FM	
			11:45AM		92.9FM	
6	06/12/2020	Sunday	1:15 -	Igbo	BOND FM	
			1:30PM		92.9FM	
7	07//12/2020	Monday	3:15 -	Pidgin	Radio One	
			3:30PM		103.5FM	
8	07/12/2020	Monday	3:45 –	Hausa	BOND FM	
			4:00PM		92.9FM	
9	07/12/2020	Monday	6:30PM	English	Women FM	
10	08/12/2020	Tuesday	3:15 –	Pidgin	Radio One	
			3:30PM		103.5FM	
11	08/12/2020	Tuesday	3:45 –	Hausa	BOND FM	
			4:00PM		92.9FM	
12	08/12/2020	Tuesday	6:30PM	English	Women FM	

13	09/12/2020	Wednesda y	11:15 – 11:30AM	Yoruba	BOND FM 92.9FM
14	09/12/2020	Wednesda y	12:45 – 1:00PM	Igbo	BOND FM 92.9FM
15	09/12/2020	Wednesda y	3:15 – 3:30PM	Pidgin	Radio One 103.5FM
16	09/12/2020	Wednesda y	3:45 – 4:00PM	Hausa	BOND FM 92.9FM
17	09/12/2020	Wednesda y	5:30PM	English	Women FM
18	10/12/2020	Thursday	10:15 – 10:30AM	Yoruba	BOND FM 92.9FM
19	10/12/2020	Thursday	12:45 – 1:00PM	Igbo	BOND FM 92.9FM
20	11/12/2020	Friday	3:15 – 3:30PM	Pidgin	Radio One 103.5FM
21	11/12/2020	Friday	3:45 – 4:00PM	Hausa	BOND FM 92.9FM
22	12/12/2020	Saturday	12:45 – 1:00PM	Igbo	BOND FM 92.9FM
23	13/12/2020	Sunday	11:30 – 11:45AM	Yoruba	BOND FM 92.9FM
24	13/12/2020	Sunday	1:15 – 1:30PM	Igbo	BOND FM 92.9FM
25	14//12/2020	Monday	3:15 – 3:30PM	Pidgin	Radio One

					103.5FM	
26	14/12/2020	Monday	3:45 –	Hausa	BOND FM	
			4:00PM		92.9FM	
27	14/12/2020	Monday	6:30PM	English	Women FM	
28	15/12/2020	Tuesday	3:15 –	Pidgin	Radio One	
			3:30PM		103.5FM	
29	15/12/2020	Tuesday	5:15 –	Yoruba	BOND FM	
			5:30PM		92.9FM	
30	15/12/2020	Tuesday	6:30PM	English	Women FM	
31	16/12/2020	Wednesda	11:00 –	Yoruba	BOND FM	
		y	11:15AM	92.9FM		
32	16/12/2020	Wednesda	12:45 –	Igbo	BOND FM	
		y	1:00PM	y 1:00PM		92.9FM
33	16/12/2020	Wednesda	3:15 – 3:30PM	Pidgin	Radio One	
		y	3:30F WI		103.5FM	
34	16/12/2020	Wednesda	3:45 – 4:00PM	Hausa	BOND FM	
		y	4.001 W1		92.9FM	
35	16/12/2020	Wednesda y	5:30PM	English	Women FM	
36	17/12/2020	Thursday	10:15 –	Yoruba	BOND FM	
30	17/12/2020	Inuisuuy	10:30AM	101404	92.9FM	
37	17/12/2020	Thursday	12:45 –	Igbo	BOND FM	
3 /	111111111111111111111111111111111111111	Indisuay	1:00PM	1800	92.9FM	
38	17/12/2020	Thursday	3:45 –	Hausa	BOND FM	
50	11/12/2020	i mui suu y	4:00PM	Tiuubu	92.9FM	

39	18/12/2020	Friday	3:15 – 3:30PM	Pidgin	Radio One 103.5FM
40	18/12/2020	Friday	3:45 – 4:00PM	Hausa	BOND FM 92.9FM
41	19/12/2020	Saturday	12:45 – 1:00PM	Igbo	BOND FM 92.9FM
42	21/12/2020	Monday	3:30 – 3:45PM	Pidgin	Radio One 103.5FM

Jingle Airings

S/N	Date	Day	Time	Radio Station & Frequency	Remar k
1	25/12/2020	Friday	8:00 – 8:30AM&	METRO FM	
			4:30 – 5:00PM	97.7FM	
2	25/12/2020	Friday	10:00 –	BOND FM	
			10:15AM& 5:00 – 5:30PM	92.9FM	
3	25/12/2020	Friday	10:00 – 10:15PM&	Radio One	
			5:00 – 5:30PM	103.5FM	
4	25/12/2020	Friday	10:00AM	WOMEN FM	
				91.7FM	
5	26/12/2020	Saturday	8:00 – 8:30AM&	METRO FM	
			4:30 – 5:00PM	97.7FM	
6	26/12/2020	Saturday	10:00 – 10:15AM& 5:00 – 5:30PM	BOND FM	
				92.9FM	

7	26/12/2020	Saturday	10:00 – 10:15PM&	Radio One
			5:00 – 5:30PM	103.5FM
8	26/12/2020	Saturday	11:27AM & 4:27PM	NIGERIA INFO LAGOS 99.3FM
9	26/12/2020	Saturday	11:40AM & 5:55PM	WAZOBIA FM 95.1FM
10	27/12/2020	Sunday	8:00 – 8:30AM&	METRO FM
			4:30 – 5:00PM	97.7FM
11	27/12/2020	Sunday	10:00 –	BOND FM
			10:15AM& 5:00 – 5:30PM	92.9FM
12	27/12/2020	Sunday	10:00 – 10:15PM&	Radio One
			5:00 – 5:30PM	103.5FM
13	27/12/2020	Sunday	10:00AM	WOMEN FM
				91.7FM
14	27/12/2020	Sunday	11:27AM & 4:27PM	NIGERIA INFO LAGOS 99.3FM
15	27/12/2020	Sunday	11:40AM & 5:55PM	WAZOBIA FM 95.1FM
16	28/12/2020	Monday	8:00 – 8:30AM&	METRO FM
			4:30 – 5:00PM	97.7FM
17	28/12/2020	Monday	10:00 –	BOND FM
			10:15AM& 5:00 – 5:30PM	92.9FM
18	28/12/2020	Monday	10:00 – 10:15PM&	Radio One

			5:00 – 5:30PM	103.5FM
19	28/12/2020	Monday	4:00PM	WOMEN FM
				91.7FM
20	28/12/2020	Monday	11:53AM &6:55PM	NIGERIA INFO LAGOS 99.3FM
21	28/12/2020	Monday	11:40AM &6:10PM	WAZOBIA FM 95.1FM
22	29/12/2020	Tuesday	8:00 – 8:30AM&	METRO FM
			4:30 – 5:00PM	97.7FM
23	29/12/2020	Tuesday	10:00 -	BOND FM
			10:15AM& 5:00 – 5:30PM	92.9FM
24	29/12/2020	Tuesday	10:00 – 10:15PM&	Radio One
			5:00 – 5:30PM	103.5FM
25	29/12/2020	Tuesday	10:00AM	WOMEN FM
				91.7FM
26	29/12/2020	Tuesday	12:25PM& 5:27PM	NIGERIA INFO LAGOS 99.3FM
27	29/12/2020	Tuesday	12:55PM&5:10PM	WAZOBIA FM 95.1FM
28	30/12/2020	Wednesda y	8:00 – 8:30AM& 4:30 – 5:00PM	METRO FM
				97.7FM
29	30/12/2020	Wednesda y	10:00 – 10:15AM& 5:00 –	BOND FM

			5:30PM	92.9FM
30	30/12/2020	Wednesda	10:00 – 10:15PM&	Radio One
		y	5:00 – 5:30PM	103.5FM
31	30/12/2020	Wednesda y	6:00PM	WOMEN FM
				91.7FM
32	30/12/2020	Wednesda y	3:27PM& 7:27PM	NIGERIA INFO LAGOS 99.3FM
33	30/12/2020	Wednesda y	3:40PM&6:40PM	WAZOBIA FM 95.1FM
33	31//12/2020	Thursday	8:00 – 8:30AM&	METRO FM
			4:30 – 5:00PM	97.7FM
34	31//12/2020	Thursday	10:00 -	BOND FM
			10:15AM& 5:00 – 5:30PM	92.9FM
35	31//12/2020	Thursday	10:00 – 10:15PM&	Radio One
			5:00 – 5:30PM	103.5FM
36	31//12/2020	Thursday	10:00AM	WOMEN FM
				91.7FM
37	31//12/2020	Thursday	11:27AM& 4:27PM	NIGERIA INFO LAGOS 99.3FM
38	31//12/2020	Thursday	1:10PM&4:40PM	WAZOBIA FM 95.1FM
39	01/01/2021	Friday	8:00 – 8:30AM& 4:30 – 5:00PM	METRO FM

				97.7FM
40	01/01/2021	Friday	10:00 –	BOND FM
			10:15AM& 5:00 – 5:30PM	92.9FM
41	01/01/2021	Friday	10:00 – 10:15PM&	Radio One
			5:00 – 5:30PM	103.5FM
42	01/01/2021	Friday	4:00PM	WOMEN FM
				91.7FM
43	01/01/2021	Friday	1:27AM& 7:27PM	NIGERIA INFO LAGOS 99.3FM
44	01/01/2021	Friday	12:55PM&6:10PM	WAZOBIA FM 95.1FM
45	02/01/2021	Saturday	8:00 – 8:30AM&	METRO FM
			4:30 – 5:00PM	97.7FM
46	02/01/2021	Saturday	10:00 -	BOND FM
			10:15AM& 5:00 – 5:30PM	92.9FM
47	02/01/2021	Saturday	10:00 - 10:15PM& 5:00 - 5:30PM	Radio One
			5:00 – 5:50FWI	103.5FM
48	02/01/2021	Saturday	12:55PM& 6:55PM	NIGERIA INFO LAGOS 99.3FM
49	02/01/2021	Saturday	11:10AM&7:55P M	WAZOBIA FM 95.1FM
50	03/01/2021	Sunday	8:00 – 8:30AM&	METRO FM
			4:30 – 5:00PM	97.7FM

51	03/01/2021	Sunday	10:00 -	BOND FM
			10:15AM& 5:00 – 5:30PM	92.9FM
52	03/01/2021	Sunday	10:00 – 10:15PM&	Radio One
			5:00 – 5:30PM	103.5FM
53	03/01/2021	Sunday	12:27PM& 7:27PM	NIGERIA INFO LAGOS 99.3FM
54	03/01/2021	Sunday	1:10PM&6:40PM	WAZOBIA FM 95.1FM
55	04/01/2021	Monday	8:00 – 8:30AM&	METRO FM
			4:30 – 5:00PM	97.7FM
56	04/01/2021	Monday	10:00 -	BOND FM
			10:15AM& 5:00 – 5:30PM	92.9FM
57	04/01/2021	Monday	10:00 – 10:15PM&	Radio One
			5:00 – 5:30PM	103.5FM
58	04/01/2021	Monday	10:00AM	WOMEN FM
				91.7FM
59	04/01/2021	Monday	11:53AM& 6:55PM	NIGERIA INFO LAGOS 99.3FM
60	04/01/2021	Monday	12:25PM&6:55PM	WAZOBIA FM 95.1FM
61	05/01/2021	Tuesday	8:00 – 8:30AM&	METRO FM
			4:30 – 5:00PM	97.7FM
62	05/01/2021	Tuesday	10:00 –	BOND FM

			10:15AM& 5:00 – 5:30PM	92.9FM
63	05/01/2021	Tuesday	10:00 – 10:15PM&	Radio One
			5:00 – 5:30PM	103.5FM
64	05/01/2021	Tuesday	7:00PM	WOMEN FM
				91.7FM
65	06/01/2021	Wednesda	8:00 – 8:30AM&	METRO FM
		y	4:30 – 5:00PM	97.7FM
66	06/01/2021	Wednesda	10:00 -	BOND FM
		y	10:15AM& 5:00 – 5:30PM	92.9FM
67	06/01/2021	Wednesda	10:00 – 10:15PM&	Radio One
		y 5:00 – 5:3	5:00 – 5:30PM	103.5FM
68	06/01/2021	Wednesda y	10:00AM	WOMEN FM
68	06/01/2021		10:00AM	
6869	06/01/2021		8:00 – 8:30AM&	FM
		y		FM 91.7FM
		y	8:00 – 8:30AM& 4:30 – 5:00PM 10:00 –	FM 91.7FM METRO FM
69	07/01/2021	y Thursday	8:00 – 8:30AM& 4:30 – 5:00PM	FM 91.7FM METRO FM 97.7FM
69	07/01/2021	y Thursday	8:00 - 8:30AM& 4:30 - 5:00PM 10:00 - 10:15AM& 5:00 - 5:30PM 10:00 - 10:15PM&	FM 91.7FM METRO FM 97.7FM BOND FM
69	07/01/2021 07/01/2021	y Thursday Thursday	8:00 - 8:30AM& 4:30 - 5:00PM 10:00 - 10:15AM& 5:00 - 5:30PM	FM 91.7FM METRO FM 97.7FM BOND FM 92.9FM
69	07/01/2021 07/01/2021	y Thursday Thursday	8:00 - 8:30AM& 4:30 - 5:00PM 10:00 - 10:15AM& 5:00 - 5:30PM 10:00 - 10:15PM&	FM 91.7FM METRO FM 97.7FM BOND FM 92.9FM Radio One
697071	07/01/2021 07/01/2021 07/01/2021	y Thursday Thursday	8:00 - 8:30AM& 4:30 - 5:00PM 10:00 - 10:15AM& 5:00 - 5:30PM 10:00 - 10:15PM& 5:00 - 5:30PM	FM 91.7FM METRO FM 97.7FM BOND FM 92.9FM Radio One 103.5FM WOMEN

			10:15AM& 5:00 – 5:30PM	92.9FM
74	09/01/2021	Saturday	10:00 – 10:15AM& 5:00 – 5:30PM	BOND FM 92.9FM
75	10/01/2021	Sunday	10:00 – 10:15AM& 5:00 – 5:30PM	BOND FM 92.9FM