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Human Papillomavirus: A Review Study of the Effect on Mental Health of Patients Infected with HPV

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Abstract

Human Papillomavirus (HPV) is one of the most not unusual sexually transmitted infections globally, affecting both women and men. HPV infections can result in quite a number of medical outcomes, from benign warts to doubtlessly life-threatening cancers. The virus is transmitted by intercourse or sexual hobby, and a few traces of HPV are categorized as excessive-danger, increasing the danger of developing cancers of the cervix, anus, penis, vagina, vulva, and oropharynx. Regardless of the availability of vaccines which could prevent HPV infections and decrease the danger of developing related cancers, the incidence of HPV-related cancers stays excessive, especially in low- and center-earnings international locations where entry to preventive measures and screening programs is limited. In this context, research performs a crucial position in information about the epidemiology, natural records, and clinical manifestations of HPV infections, as well as in developing effective prevention and management techniques. HPV infection is the maximum not unusual Sexually Transmitted Infection (STI) internationally, with an anticipated prevalence of around 11% among women. Despite the fact that maximum HPV infections are asymptomatic and remedy spontaneously inside years, some continual high-threat HPV infections can lead to cervical cancer and other genital cancers. As cervical most cancers are the fourth most common cancers in girls globally and are responsible for vast morbidity and mortality, HPV infection is a full-size public health situation. Vaccines in opposition to HPV have evolved and are effective in stopping HPV-associated cancers and other illnesses. But, the uptake of HPV vaccination and screening programs remains suboptimal in many countries, emphasizing the need for research to perceive the elements influencing HPV-related health behaviors and attitudes.

Keywords: Anxiety • Human papillomavirus infection • Psychosexual distress • Sexual activity • Cervical cancer • Mental health • Questionnaire

Introduction

This study aimed to analyze the effect of Human Papillomavirus (HPV) positivity on ladies' intellectual health and Sexual Dysfunction (SD). Anxiety, hopelessness, and despair were measured using the Turkish model of Beck melancholy stock, Beck anxiety stock, and Beck Hopelessness Scale, respectively. The lady Sexual Feature Index (FSFI)-6 changed into used to measure sexual dysfunction in ladies [1-5]. The look involved 213 individuals, who have been divided into organizations based totally on HPV check effects: HPV-nice and HPV-negative. The examination found a sizable difference between the two organizations in FSFI general scores and all subdomains, as well as in BDI, BHS, and BAI ratings. There was a considerable correlation among FSFI and BAI in each group and among FSFI and BDI inside the HPV-poor institution. The study shows that girls with HPV are at extra risk of mental fitness problems and sexual dysfunction and should be supported by way of the healthcare gadget. The diagnosis of HPV may additionally result in mental discomfort, and informing the patient appropriately is crucial to help them adapt to the ailment. The disease might also lead to changes in life-style and fineness of life, and the goal is to help patients in this manner.

Literature Review

The primary part of the studies concerned undertaking qualitative interviews with 46 ladies elderly between 25 and 65 years, who had been selected from community and secondary care settings. The interviews have been performed using an aggregate of semi structured and attention organization techniques. The statistics accrued changed into analyzed the usage of the inductive-framework technique. Inside the second part of the studies, in-depth interviews have been conducted with seventy four women who had gone through HPV testing in England between 2001 and 2003 [6-9]. The ladies had been decided on the use of purposive sampling to ensure heterogeneity in age, ethnicity, marital reputation, socioeconomic background, cytology, and HPV effects amongst individuals. The interviews generated qualitative facts that have been additionally analyzed the use of the qualitative method. The research targeted on understanding the psychological responses of girls, together with their cognition, feelings, and behavior, to HPV infections.

Inside the third part of the studies, a move-sectional case-control observation was conducted with 213 women between February 2021 and might 2022 [10]. The look was carried out at the Medistate health facility Gynecology and Obstetrics medical institution in Turkey. The protocol was authorized through the Ethics Committee of Beykoz University and conformed to the ethical hints of the 1975 declaration of Helsinki. The individuals were divided into two organizations: a manipulate group which includes 116 women and a look at group along with 97 women who have been infected with HPV in the last year. The inclusion criteria have been between a while of 20 and 45, whilst the exclusion standards have been being pregnant or breastfeeding period, diabetes, thyroid disorder, and systemic illnesses. The study measured the sexual disorder in women using the Turkish version of the lady Sexual Function Index (FSFI-6) and in comparison the ratings of HPV-superb ladies with the manipulate group. The observer also used the Beck melancholy stock (BDI), Beck Tension Inventory (BAI), and Beck Hopelessness Scale (BHS) to assess the signs of despair, anxiety, and hopelessness. Statistical analyses were achieved using SPSS v20, and a price of $p < 0.05$ changed into widespread as statistically sizable. The study aimed to take a look at the differences among the 2 businesses in all FSFI subdomains, and the relationship between the questionnaire variables was tested using the Spearman take a look at.

Methods

The inclusion criteria for the observational have a look at have been women identified with premalignant lesions of the cervix, vagina, or vulva. The exclusion criteria were ladies with a history of hysterectomy, a previous analysis of cancer, or folks that had passed through radiation therapy or chemotherapy. a complete of one hundred twenty ladies were recruited from the colposcopy sanatorium and supplied informed consent to take part within the study. The examiner used a mixed-method method to gather data, together with both quantitative and qualitative techniques. Quantitative facts were gathered through a survey that covered questions about socio-demographic characteristics, scientific records, sexual behavior, and know-how and attitudes in the direction of HPV and cervical cancer. The survey is

administered to individuals before their colposcopy appointment. Qualitative records were amassed via in-intensity interviews with a subset of the members who had been diagnosed with high-grade premalignant lesions. The interviews explored individuals' experiences with the colposcopy manner and their know-how of the prognosis. The interviews have been carried out after the participants had obtained their analysis and had undergone colposcopy. The statistics accumulated from both the survey and the interviews have analyzed the usage of descriptive data and content evaluation, Astronomicalrespectively. data and content evaluation, respectively.

Result

Take a look at this study's paper aimed to investigate the sexual dysfunction and mental factors in girls inflamed with oncogenic or excessive-chance Human Papillomavirus (HPV). The research hired a quantitative approach using standardized questionnaires to evaluate sexual characteristics and mental properly-being. A total of 97 infected with HPV and 116 controls participated inside the study. The effects showed that the HPV-infected organization had substantially lower scores in all domain names of the female Sexual Function Index (FSFI) and better ratings in melancholy, anxiety, and hopelessness than the managed group [10]. These findings endorse that HPV contamination may have bad effects on sexual function and psychological fitness in women.

One of the strengths of this have a look at is using standardized questionnaires to evaluate sexual features and mental proper-being, which will increase the validity and reliability of the records. Furthermore, the sample size of the have a look at became adequate and numerous, along with ladies with one-of-a-kind a long time, marital statuses, and socioeconomic backgrounds [8]. The examiner's obstacles consist of the pass-sectional design that makes it difficult to establish causality, and the recruitment of individuals from a single medical center which could restrict the generalizability of the findings. Furthermore, the observer did no longer keep in mind the impact of HPV vaccination or the severity of the contamination on sexual characteristics and psychological well-being [11].

Normally, the study's findings shed mild light at the need for greater interest in the mental and sexual fitness of womens infected with HPV. Healthcare companies ought to not forget screening for sexual dysfunction and psychological misery in womens with HPV contamination and provide appropriate interventions to improve their first-class lifestyles. Future studies may additionally gain from a longitudinal layout to research the lengthy-time period outcomes of HPV contamination on sexual feature and psychological well-being, and include extra diverse samples from multiple scientific facilities.

Discussion

They took a look at determining that there's a giant effect of HPV infection on girl sexual characteristics, and it also showed a correlation between HPV infection and depression, anxiety, and hopelessness. The observation highlights the want for healthcare providers to not forget the psychosocial outcomes of HPV infection in ladies and provide appropriate support and counseling. Moreover, the observation emphasizes the significance of HPV vaccination and early detection to save you and manipulate the bodily and mental results of HPV contamination.

Conclusion

The outcomes of this examination showed that women inflamed with excessive-danger HPV had decreased sexual functioning rankings in comparison to the control group. They also had better degrees of depression and tension signs and hopelessness. Those findings spotlight the need for psychological support for ladies with HPV, especially the ones diagnosed with premalignant lesions. The look also tested the importance of the use of qualitative research methods, consisting of in-depth interviews and focus corporations, to accumulate wealthy facts on individuals' stories and perceptions. Commonly, this examination contributes to a higher expertise of the psychological impact of HPV on girls's sexual fitness and well-being.

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Using the "Addictive" use of Social Media as an Example, Deconstruct the Components of the Addiction Model

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Abstract

According to the components model of addiction, all addictions have salience, tolerance, mood modulation, relapse, withdrawal, and conflict in common. Numerous psychometric tools have been created as a result of this highly effective model, which assess addictive behaviours in accordance with these standards. But according to recent research, certain elements in the context of behavioral addictions are peripheral characteristics that do not differentiate between pathological and non-pathological behaviour. We tested whether these 6 components actually evaluate core features of addiction or whether some of them comprise peripheral features that are not indicative of a disorder by using "addictive" use of social media as an example.

The Bergen Social Media Addiction Scale, a 6-item psychometric instrument developed from the components model of addiction to evaluate social media "addiction," was completed by 4,256 participants from the general population drawn from four independent samples. We demonstrated the six components did not constitute a unitary construct through structural equation modelling and network analyses, and importantly, some components (such as salience and tolerance) were not related to measures evaluating psychopathological symptoms.

Together, these findings imply that when applied to behavioural addictions, psychometric tools based on the components model confound central and peripheral characteristics of addiction. This suggests that using these tools pathologizes engaging in appetitive behaviours. Thus, our results urge a revision of how behavioral addictions are conceptualised and evaluated.

Keywords: Behavioural addiction • Components model • Network analysis • Social media use • Structural equation modelling analysis

Introduction

The study of behavioral addictions has drawn more attention in recent years, and there have also been an increasing number of scholarly papers in this area. The fifth edition of the Diagnostic and Statistical Manual of Mental Disorders includes gambling disorder as an addiction condition that is associated with substance use disorders, which has contributed to this efflorescence. The so-called "confirmatory approach" to behavioral addictions is to blame for the growing prevalence of these "behavioral addictions." The process through which increased engagement in appetitive activities is a priori understood as an addicted condition is known as the confirmatory method. By adapting the criteria for substance addiction, psychometric tools are then created to evaluate and diagnose these behavioral addictions.

Many of these recently proposed behavioral addictions, as well as the corresponding psychometric tests, are based on Griffiths' operationalized components model of addiction. (2005). The six core components of this model, which was adapted from Brown's (1993) components model of substance addiction, are: (1) salience (cognition, affect, and conation focused on carrying out the behavior), (2) tolerance (increasing involvement in the behavior to maintain a comparable experience), (3) mood modification (involvement in the behavior to achieve a desired affect), and (4) relapse prevention.

Since some of these criteria (such as salience and tolerance) are not always applicable to non-substance-related addictions, some authors have critiqued the use of these criteria to operationalize and evaluate behavioral addictions. It has even been suggested that the urge to "legitimize" behavioral addictions may have motivated the stealing of drug addiction criteria like tolerance and withdrawal. For instance, in the context of online video gaming, Charlton and Danforth (2007) questioned the structural validity of the 6-component model. They identified two factors they dubbed "engagement" (consisting of ancillary components that do not distinguish non-pathological from pathological behavior, namely salience, and "engagement"(consisting of peripheral components that do not distinguish non-pathological from pathological behavior) by performing exploratory factor analyses on questionnaire items tapping the six components of addiction proposed.

Along with social media's rising popularity and user base, the idea of a social media "addiction" has become more prevalent. However, a lot of research in this area relies on the confirmatory strategy mentioned above, conceiving increased social media use in relation to characteristics of addiction and creating psychometric tools to measure these characteristics. The classification of social media use as a behavioral addiction is still up for debate, but some experts believe it to be a real disorder that falls under the umbrella of other specified disorders due to addictive behaviors in the 11th edition of the International Classification of Diseases.

According to Steegen, this study uses a multiverse methodological approach that combines two different psychometric frameworks: network analysis and structural equation modeling analysis. In network analysis, psychopathological disorders are represented by the intricate relationships among their symptoms.

Therefore, we first sought to ascertain whether the components cohered into a unitary construct (as postulated by the components model and assessed by psychometric instruments derived from this model) or emerged as multiple distinct constructs (combining, for example, central and peripheral components, consistent with Charlton and Danfo) by performing structural equation modeling and network analyses within these six components in the context of "addictive" use of social media. We then sought to ascertain whether all components were associated with psychopathological symptoms, that is, whether all components were actually reliable indicators of a disorder, or whether some of them were not, by conducting network analysis within these components and a wide range of psychopathological symptoms.

The overall sample was made up of an amalgamation of four separate databases with people drawn from earlier studies that had all gotten ethical approval from local ethics committees and some of which had, up to this point, resulted in peer-reviewed journal papers. Each participant was based in Italy and spoke Italian. They participated by completing five self-administered psychometric tests that were available online for this investigation. Prior to participating, each subject gave their informed consent; there was no payment.

Although behavioral addictions have drawn more attention over the past 20 years, there is mounting evidence that several operationalization criteria sets fail to appropriately separate non-pathological from pathological conduct. The goal of the current psychometric investigation was to determine if the six-component model of addiction essentially assesses key elements of addiction or if it confounds central and peripheral features of addiction by employing "addictive" social media use as a typical example. To do this, the current study employed a multiverse methodological approach depending on network analyses and structural equation modeling.

Our results showed that the 6 components of addiction – as measured by the 6-item Bergen Social Media Addiction Scale – did not cohere into a unitary construct, but rather into a dimensional construct. Furthermore, the first identified dimension – comprising the two components of tolerance and salience – showed no association with any measures of psychopathological symptoms included in the present study. In contrast, the second dimension – comprising the four components of mood modification, relapse, withdrawal, and conflict – was positively associated with several measures of psychopathological symptoms included in the present study.

Our findings have significant ramifications for how behavioral addictions are conceptualized and evaluated. Screening for behavioral addictions in accordance with the components model results in pathologizing involvement in appetitive behaviors by including criteria reflecting peripheral features - such as the components of salience or tolerance - yet assumed to be indicators of addictive disorders stricto sensu. This is important because, according to a growing body of research, the components model cannot tell apart pathological behavior from non-pathological behavior, such as in the setting of video games or physical activity. Overall, the results of this study, which used a data-driven multiverse psychometric method, support those assumptions [1-3].

It is important to recognise the limitations of the current investigation. First, sample variability presents a reproducibility difficulty within the context of network analysis. We evaluated the stability and precision of the derived network model parameters to address the latter. Second, variables are still treated as observed variables within the context of network analysis, which ignores measurement error. The performance and reliability of the estimated network models were significantly enhanced by combining data from several indicators per node by looking at factor scores (rather than item scores) in order to solve the latter. Additionally, we used a new methodological approach based on structural equation modeling and network analysis to solve both of the aforementioned problems in the factorial structure analyses [4-5].

Third, we combined four separate databases that had people that were chosen from several earlier study initiatives. However, because of how we used this approach, we were able to use a substantial sample size, thus we do not see this as a serious constraint. Fourth, in order to maintain the general accuracy of our results, some psychopathological symptoms' scores have to be integrated by principal component analysis prior to doing the network analyses. Together, the findings of this study lend credence to the idea that when used with behavioral addictions, psychometric tools based on the components model confound central and peripheral elements of addiction.

Conclusion

Our results in the situation of "addictive" social media use, however, did not support the notion that the component of mood alteration forms a peripheral requirement, in contrast to the conclusions of the foundational work of Charlton and Danforth in the context of "addictive" video gaming. Griffiths' transformation of Brown's initial "euphoria" component into a "mood modification" component, which is predicated on the idea that addictive behaviors are engaged in to control both happy and negative affective states, is likely to account for this distinction. A positive affective state (i.e., "I frequently experience a buzz of excitement while playing") was really tapped when Charlton and Danforth used the initial "euphoria" component for their psychometric instrument. The 6-item Bergen Social Media Addiction Scale. on the other hand, is detecting a negative emotional. Therefore, rather than reflecting a "addiction" to social media, it is more likely that those endorsing the latter item use social media as a maladaptive coping mechanism or as a symptom of underlying problems. Furthermore, because the component of mood modification considers both positive and negative affective states, assessing it with a single item that only measures a negative affective state implies inadequate construct coverage and, as a result, low content validity.

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An Examination of the State of Refugee Mental Health in the Nations of the Global North

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Abstract

Refugees' mental health is significantly impacted by post-migration factors. The role of place in refugee mental health is examined in this scoping review. 34 studies on place characteristics in high-income countries in the Global North's cities, neighborhoods, rural areas, and nations were included. Despite the fact that the role of place is still poorly understood, all studies have found similarities that support a close connection between the place of residence and the outcomes of refugee mental health and wellbeing in the context of post-migration. Given that refugees frequently have little or no control over where they ultimately reside, we propose that future research should concentrate on how location-specific factors influence the risks, safeguards, and outcomes for post-migration refugee mental health.

Keywords: Cities • Inequalities Interdisciplinarity • Mental health • Scoping review • Social model Social theory • Youth

Introduction

The main features of place and the pathways connecting place to refugee mental health in post-migration contexts are evaluated in this scoping review of the literature, with a focus on the Global North. 73% of the 82.4 million people who are currently displaced live in nearby Low- and Middle-Income Countries (LMICs). High-income nations only take in a small percentage of refugees, mostly in the Global North (UNHCR, 2020). Global North nations offer special circumstances based on distinct economic, cultural, and sociopolitical realities from those of the majority of refugee-hosting nations, many of which are refugee camps [1].

There are differences between and within nations in the local laws governing where refugees can live and how they can interact with their new environments and host societies. For instance, refugees only have 28 days from the time they are granted asylum in the UK before their support for their claim expires. During that time, they must either find employment and private housing or apply for welfare and housing support (Citizens Advice, 2020). It has been demonstrated that a rapid transition from severely constrained social and economic options to complete self-sufficiency is very stressful.

In contrast, state and local governments offer practical assistance and refugees are required to participate in integration programs in Denmark. In light of this, refugee vulnerability after migration and their longer-term residence is a uniquely modifiable exposure that is impacted by policies for relocating asylum seekers, programs for integrating them into society, and onward migration, particularly in the Global North. Therefore, it is crucial to look at the various place-related factors that affect where refugees live, howstructural conditions translate into real-world situations, and their importance for the mental health and wellbeing of refugees [2-4].

According to the 1951 Refugee Convention, "persons who have escaped their country due to war, violence, persecution, or natural disaster" are considered refugees. They need to be hosted elsewhere because it is too dangerous for them to return to their home countries (UNHCR, 2020). The review focuses specifically on individuals who have been granted legal refugee status in nations of the Global North. That is, since their connections to and perceptions of various locations are frequently very different, we do not concentrate on asylum seekers, internally displaced people, or stateless people. The term "post-migration context" refers to the time following the approval of asylum requests in a host country.

There may still be domestic or international migration during this time "Place" is what we define as the places where refugees reside and engage in social, economic, cultural, environmental, and material interactions with others and institutions. Place is another area of refugee governance where political systems and administrative frameworks shape refugees' daily lives in ways that could have a significant negative impact on their mental health and establish pathways to welfare, employment, and education [5-6].

Review of Literature

According to epidemiological studies, refugees have higher rates of anxiety, PTSD, psychotic disorders, and major depression than the general population. Studies examining post-migration factors typically show associations with anxiety, mood, and substance use disorders, and psychosis, whereas studies examining pre-migration experiences of adversity and trauma typically show associations with PTSD and depression. It is well known that pre-migration trauma and unpleasant flight experiences affect the mental health of refugees. However, studies have shown that even after settling in host countries, the psychological distress of a precarious life persists. Research on refugee mental health has taken into account the post-migration context since the 1980s, when the dominant "stresses of acculturation" models highlighted the importance of cultural diversity and adjustment challenges in new environments. Early research overwhelmingly supported specialized mental health interventions and acknowledged the long-term negative effects of psychological trauma endured by refugees. However, they did not pay enough attention to how structural and environmental factors played a part.

According to some academics, the "refugee crisis" of 2015–16 has brought the issue of refugee integration to the fore in the countries of the Global North, necessitating an examination of host societies. Nevertheless, the conflict in Ukraine and the treatment of refugees from the country have brought to light glaring disparities in how individuals from various ethnic backgrounds and countries of origin are welcomed and treated. As a result, connections between refugee status and chances to access social and economic resources will probably vary depending on how each refugee is situated in relation to their national and ethnic background, economic situation, gender, and level of education.

These studies' use of the concept of therapeutic landscapes helps to clarify how actively involved refugees are in locating healing routes. According to a study by El-Bialy and Mulay (2015), harsh weather conditions and inhospitable landscapes present difficulties for refugees accustomed to other climates. Even after living there for a long time, refugees in isolated Canadian provinces complained about the oppressive climate and how the lack of sunlight made them feel more miserable and homesick. However, the study also found that some people learned to value nature and outdoor pursuits, claiming that this reduced pre-migration trauma, homesickness, and depression and promoted wellbeing. Reported similar results for refugees dispersed to rural Danish and Norwegian locations [7]. The physicality and materiality of a place can also be a safeguard for the mental

health and wellbeing of refugees. Sampson and Gifford (2010) discovered that homes, schools, libraries, and parks were the most crucial locations for young, recently arrived refugees in Australia. This made it possible to explore new social and geographical settings that came to be associated with safety and belonging. They were grouped by the authors as opportunities, beautiful and comfortable settings, social hubs, and secure areas. The study's use of visual methods also highlighted a contrast between safe and unsafe environments. The places of safety were near the places of threats and violence. Participants ran the risk of being attacked and subjected to racism, for instance, in isolated school grounds and train stations. Even when a facility is intended to serve a therapeutic purpose, it undermines recovery. According to a study by Brenman (2020), a psychotherapy center's geographic and physical instability was detrimental to the mental health of refugees. A friendly and stable environment was hampered by a lack of funding and by the absence of a permanent home. As a result, refugee service users reported feeling a strong sense of ambivalence as clients and doubt about deserving care, leading to a sense of "precarious belonging."

Conclusion

34 studies on the impact of place on the mental health of refugees are presented in this scoping review. These employ a variety of methodology and have various notions of both place and mental health. Despite the fact that this field of study is still in its infancy, we were able to identify a number of recurring themes that centre on: the material and physical aspects of place; place-specific social determinants, such as employment opportunities and institutional support; the experience of residential instability and mobility; the significance of ethnic density and localized social support networks; and, lastly, recent work on neighbourhood violence and disorder. These give future research in this emerging field a helpful place to start.

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Gut Microbiome, a Link between Nutrition, Physiology, and Pathology: Insights into Current Status and Future Directions

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Abstract

The gut and placental microbiome have emerged as key determinants of human health and well-being, with their beneficial effects extending well beyond the confines of the digestive and reproductive systems. Recent advances in microbial research have revealed that these microbial communities play crucial roles in nutrient absorption, immune modulation, and even neurobehavioral processes. By regulating the host-microbe interaction and maintaining a balance between commensal and pathogenic bacteria, the gut microbiome is vital for maintaining optimal health and preventing a host of chronic diseases. Dietary fiber plays a critical role in promoting a diverse and healthy gut microbiome, which confers many health benefits to the host. This review article delves into the different functions that gut microbiota can potentially perform in shaping our health status and the implications of gut microbiome disturbances on human health in the form of various gastrointestinal as well as extra-intestinal diseases. Furthermore, we shed light on current scientific investigations that have widened our grasp of the human microbiome, specifically cutting-edge molecular sequencing technology, and analytical approaches. A more nuanced comprehension of this intricate concept harbors diagnostic and therapeutic implications for various pathogenic pathways linked to inflammatory and neoplastic diseases.

Keywords: Gut microbiota • Short-chain fatty acids • Microbiota-accessible carbohydrates • Obesity • Diabetes • Asthma • Autism spectrum disorder • Alzheimer's disease • Metagenomics analysis

Introduction

Microbiotas are the symbiotic organisms of thousands of species that are abundantly present inside and outside the human body, coexisting harmoniously while performing multiple functions that are crucial for optimal physiological processes and well-being. The gut microbiota has been shown to influence various aspects of human physiology, including metabolism, immunity, and brain function. These microorganisms include bacteria, fungi, and viruses, and interestingly, their population in the human body surpasses that of human cells [1]. The human microbiome comprises approximately 10 trillion-100 trillion symbiotic microbial cells present in each individual, making the number of microbial cells in our body more than that of human cells. The human gut alone accommodates up to 1,000 species of microbiota that perform diverse functions [2]. Microbiomics is an expanding discipline that involves investigating these organisms, their roles, and their effects on the human body.

Beginning in the 1680s, when Antonie van Leeuwenhoek compared his oral and fecal flora, research on the diversity of the human microbiome began. He observed the considerable variations in microorganisms between these two habitats as well as between samples from people in healthy and diseased stages in both of these locations [3,4]. Research into the remarkable differences between microorganisms in various anatomical locations, and the differences between their roles in health and disease, dates back to the earliest days of microbiology. However, recent cutting-edge breakthroughs in technology have enabled us to utilize powerful molecular tools to investigate the underlying reasons behind these distinctions and even manipulate the transformations between states. It is not the observation of these evident contrasts that is groundbreaking today, but rather the ability to elucidate the mechanisms that give rise to them. The mutual evolution of vertebrates and their associated microbial communities, spanning over hundreds of millions of years, has resulted in a distinct microbial consortium that thrives in the gut's stable, nutrient-rich, and warm surroundings. While archaea, eukaryotes, and viruses are also present in the gut, albeit in smaller quantities and should not be overlooked, bacteria comprise the bulk of the biomass and diversity within the human gut and in all other ecosystems that are interconnected with human beings [5-7].

While there are some microorganisms that are pathogenic, it is worth noting that both symbiotic and pathogenic microbiota coexist. There is a complex interplay between symbiotic and pathogenic microorganisms within the human body. The vast majority of the microbiome comprises of beneficial and symbiotic microorganisms that provide advantages to both the host and the microbiota. However, symbiosis can occur due to certain infectious diseases, poor diets, or prolonged usage of antibiotics or other antibiotic-like drugs. This can render an individual more susceptible to a range of diseases, varying in severity from mild to severe [8-11].

One of the most widely scrutinized topics pertaining to the human microbiome is the gut. This manuscript furnishes comprehensive details about the gut microbiome, its diversity, and its influence on human well-being and pathological conditions. It also explores the placental microbiome, its potential role in neonatal gut colonization, the development of the microbiota from infancy through early childhood, and the impact of various factors, such as birth mode and diet.

Literature Review

Fiber, fatty acids, and the gut microbiota: How they shape our health

The gut microbiome is a complex and diverse community of microorganisms that plays a critical role in the regulation of digestion, immunity, and other important bodily processes throughout life. It is an amalgamation of diverse and fluctuating microorganisms which vary according to numerous factors including age, sex, race, ethnicity, gender, and lifestyle choices such as the use of alcohol, smoking, and physical activity, as well as geographical location and medications [12].

Research has shown that an imbalance in the gut microbiota can have negative effects on health, contributing to the development of various diseases, including obesity, diabetes, and inflammatory bowel disease. On the other hand, a healthy gut microbiome can help prevent these diseases and promote overall well-being. Studies have also highlighted the impact of various factors on the gut microbiome, including diet, antibiotic use, age,

and environmental factors such as sanitation. For example, a study published in Nature Microbiology found that the gut microbiota of individuals in developed countries is less diverse than those in less developed areas due to factors such as increased hygiene practices and a more processed diet [13-15].

Hippocrates studied the gastrointestinal properties of coarse wheat versus refined wheat in 430 BC, while J.H. Kellogg wrote numerous articles on the benefits of bran in the 1920s, asserting that it boosts stool weight, facilitates laxation, and prevents illnesses [16]. The 1930s saw extensive research on dietary fiber, however, afterward it was neglected until the 1970s. Diet significantly influences the types of bacteria that exist in the colon, in addition to environmental factors, medication use, and genetics from the family[17,18].

A higher intake of dietary fiber plays a crucial role in the prevention of cardiovascular diseases and in maintaining gut health. Regularly consuming the recommended amount of fiber has the potential to attenuate glucose absorption rate, prevent weight gain, and increase the intake of beneficial nutrients and antioxidants in the diet, all of which may help prevent diabetes. Dietary fibers exhibit a diverse range of physicochemical properties and corresponding physiological effects [19,20]. Martinez et al performed a study that used 16S rRNA gene sequencing to analyze the gut microbiota of healthy individuals after a whole grain intervention and found that the whole grain diet increased the abundance of specific bacterial taxa, which were associated with improved immune function and lower inflammation[21]. Another study analyzed data from 185 observational studies and 58 clinical trials to evaluate the effects of different types of carbohydrates, including fiber, on various health outcomes. The authors found that higher intakes of dietary fiber were associated with lower risks of cardiovascular disease, type 2 diabetes, and colorectal cancer [22]. The effects of dietary fiber on hunger, satiety, energy intake, nutrient absorption and body composition in healthy individuals are well documented [23,24]. Dietary fiber can also promote weight loss or prevent weight gain. Other less well-known health benefits of dietary fiber include its effects on immune function, bone health, and cognitive function [25].

Role of Short-Chain Fatty Acids (SCFA)

The microbiota in the colon digests the fiber, producing short-chain fatty acids that contribute to shaping the gut environment, influencing the physiology of the colon, and eventually serving as an energy source for host cells. By playing an important role in different host-signaling mechanisms, these fatty acids have enormous potential for promoting a healthy body [26,27]. Microbial degradation of dietary fiber in the gut is a complex process, including the role of different microbial populations in breaking down and fermenting different types of fiber. Since dietary fiber can only be broken down and fermented by enzymes from microbiota living in the colon that eventually release SCFAs, the pH of the colon becomes more acidic, creating an environment favorable for a specific type of microbiota that can survive in the acidic conditions[28]. While some harmful bacteria cannot survive in this acidic pH, there are numerous benefits of SCFA, including stimulating immune cell activity and maintaining normal blood levels of glucose and cholesterol [29]. Numerous studies have discussed the potential for dietary interventions targeting SCFA production to improve metabolic health [30-32].

The crucial role of gut microbiome in maintaining optimal health from the beginning

The gut microbiome holds sway over the human physique from the moment of birth and persistently influences vital bodily functions such as the digestive, immune, and central nervous systems [33-35]. The placenta was once thought to be sterile, but recent studies have shown that it harbors a diverse microbiome that can impact fetal development. Despite its manifold metabolic and immunological regulating functions, the placental microbiome's compositional and functional diversity remains relatively underexplored. Impactful research has nonetheless evinced a correlation between placental microbiota and antenatal infection history, maternal weight gain, and the altered placental membrane microbiome seen in preterm birth, which remains a significant cause of neonatal morbidity and mortality [36-41] .The early microbial composition of neonates is significantly influenced by both delivery method and gestational age. The mode of delivery, whether vaginal or caesarean, plays a crucial role in determining the initial contact between the fetal body and the microbiome, with the former more closely resembling the maternal flora. Interestingly, infants delivered by cesarean section exhibit a gut flora composition that is less similar to their mothers compared to those delivered vaginally [42-44].

From the moment of birth, a newborn is surrounded by microorganisms, and as the child grows, the gut microbiota begins to colonize [45-47]. The adult gut microbiome, which is influenced by important factors such as an increase in the abundance of Bacteroidetes, elevated fecal SCFA levels, enrichment of genes related to carbohydrate utilization, vitamin biosynthesis, and xenobiotic degradation, is reliant on oral feeding. The composition of the microbiota is significantly influenced by prolonged nursing, which is crucial for the structure and function development of the microbiome [48-50] . Breast milk is rich in chemicals that play a vital role in promoting the growth of *Bifidobacteria* and *Bacteroides* [51,52]. Despite being able to digest lactose, the infant's small intestine lacks the glycoside hydrolases and intestinal membrane transporters needed to break down the human milk oligosaccharides. As a result, milk glycans can increase the number of bacteria in the gut microbiota that break down complex carbohydrates [53]. The introduction of solid food and the cessation of breastfeeding results in a shift in their composition to an adult-like microbiota [54-56]. Variations in the microbial community during the first months are driven by factors such as sanitary conditions or antibiotic use. [57-59] The mechanisms linking these and other important factors to the construction of the microbiota are still being investigated.

Factors that impact gut microbiota and disease

The gut microbiome is impacted by a variety of factors, including stomach pH, bile acids, digestive enzymes, and antimicrobial proteins in the duodenum, among others. Other major variables can also affect microbial colonization further downstream, such as chemical parameters like pH, oxygen concentrations, mucus, and antibodies, as well as anatomical abnormalities related to gut receptors, immune cells, and nerve cells. These factors can ultimately influence gut peristalsis and transit times, playing an essential role in the alteration of the microbiome and host relationship [60-62].For instance, Sonnenburg, E.D. et al describe in their article how a diet deficient in Microbiota-Accessible Carbohydrates (MACs) can affect the composition and function of the gut microbiota and ultimately alter the host-microbe relationship [63]. Consequently, the gut microbiome has emerged as a significant factor in various metabolic and immune diseases.

Gastrointestinal diseases and diseases of the hepatobiliary system, including intestinal bowel diseases, celiac disease, irritable bowel syndrome, colorectal cancer, chronic liver diseases, and pancreatic disorders, have been linked to the gut microbiota [64,65]. Various extra-intestinal disorders, such as obesity and obesity-related disorders like type 2 diabetes and non-alcoholic fatty liver disease, have also been linked to the gut microbiome, mainly due to its effects on glucose regulation and correlation with insulin resistance [66-70]. Ley R. E. discussed in their article the role of microbiota in energy metabolism, particularly in the context of obesity. The author also describes the potential mechanisms by which gut microbiota may contribute to the development of obesity, including increased energy harvest and storage, altered gut hormone signaling, and inflammation [71].

Extraintestinal pathology due to gut microbiota dysbiosis

Respiratory Conditions: Susceptibility for development of asthma has been noted in neonates and infants who have correlations with gut microbiome dysbiosis, including microbial depletion and fungal overgrowth. In their infancy, these neonates' fecal metabolic profile exhibited a deficiency of omega-3 fatty acids and prostaglandin precursors [72]. Numerous researchers have shared profound insights regarding the interplay between environmental pollution, gut microbiota, and allergic bronchitis/asthma [73,74]. Multiple studies have revealed that the administration of vancomycin was connected to a reduction in gut microbial diversity, altered metabolic profiles, intensified Th2 responses, and an elevated likelihood of allergic bronchitis [75]. The provision of SCFAs has been revealed to alleviate alveolar inflammation, primarily attributed to reduced T cell activity, specifically a decrease in IL-4-producing CD4+ T cells and decreased circulating IgE levels [76].

CNS diseases and Behavioral problems: The gut microbiota has been revealed to act as a mediator of biochemical signaling in the gut-brain axis, demonstrating an association with disrupted gut microbial homeostasis [77]. Disordered microbial flora have exhibited significantly elevated concentrations of SCFAs and ammonia, the metabolites of which may harbor a neurotoxic influence leading to various CNS disorders [78,79]. The microbial composition of the gut has been found to be intricately linked to Autism Spectrum Disorder (ASD) and other neurodevelopmental conditions characterized by aberrant behavior, cognitive impairment, and mental distress [80-84]. Presently, many researchers are investigating the relationship between the gut microbiota and stroke pathogenesis, Alzheimer's disease, as well as novel therapeutic opportunities for addressing these conditions with the prism of the gut microbiome [85,86].

Cardiac conditions: Recent studies have brought to light the fact that the gut microbiota is capable of influencing the entire host body. Over the past two decades, there has been a substantial amount of research dedicated to comprehending the evolution of gut microbiota and its implications for risk factors associated with cardiovascular diseases [87]. Substantive evidence has further validated the causal impact of the gut microbiota on Cardiovascular Disease (CVD). Notably, studies on gut microbiota transplantation, gut microbiota-dependent pathways, and downstream metabolites have demonstrated their ability to influence host metabolism and the onset of CVD. For instance, Trimethylamine N-Oxide (TMAO), a met organismal metabolite produced following the consumption of dietary nutrients prevalent in a Western-style diet, and more recently, Phenyl Acetyl Glutamine (PAG), a phenylalanine-derived metabolite, are examples of gut microbiota-dependent metabolites. Elevated levels of these metabolites in the bloodstream have been linked to increased CVD risk in large-scale clinical studies [88-90].

Revolutionizing microbiome research: The power of molecular analysis

The swift advancements in high-throughput molecular methods have facilitated in-depth analysis of the microbiota's genetic and functional diversity, enabling us to comprehend the species present, their relationships with each other, the expressed genes, and the ongoing metabolic activities [91,92]. With the advent of cutting-edge platforms such as Illumina, 454 Roche, Pac Bio, and Oxford Nano pores, we can now perform metagenomics, metatranscriptomics, met proteomics, and met metabolomics, allowing us to explore biological signatures related to specific environments [93-97].

Metagenomic analysis of gut microbiota involves sequencing the DNA of all the microorganisms present in a given sample and then using bioinformatics tools to identify and characterize the microbial community. This approach has revealed the tremendous diversity of the gut microbiota and has led to the discovery of numerous novel microbial species and genes. Metagenomic analysis has also been used to investigate the role of the gut microbiota in various diseases, including inflammatory bowel disease, colorectal cancer, and metabolic disorders [98-100]. The continual improvement of sequencing techniques and analytical approaches enhances our understanding of the human microbiome, including its definition and constituents. Furthermore, by gaining a better understanding of the gut microbiota and its functions, we may be able to develop new strategies for preventing and treating these diseases.

Conclusions

Studies are ongoing to explore the critical importance of the gut microbiome, the various ways in which the gut microbiome influences human health, and potential therapies to manipulate the microbiome to treat diseases. In the meantime, it is important to prioritize a healthy lifestyle to support the health of our gut microbiome and our overall well-being.

The swift progression of sequencing methods and analytical techniques is augmenting our capacity to understand the human microbiome, as well as our conception of the microbiome and its elements. Therefore, we believe that there is ground for cautious sanguinity that further innovations in sequencing technology and comprehension of the microbiome will present thrilling opportunities for utilizing the microbiota for personalized medicine.

Conflicts of Interest

The author declares that he has no financial or personal relationship which may have inappropriately influenced him in writing this article.

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Review of COVID-19 Pandemic, Factors Associated with the Spread and Containment Challenges within Four Months of the Outbreak in Nigeria

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Abstract

The COVID 19 outbreak which started in the Hubei province of China in December 2019 has assumed the new acme of life-threatening infection ravaging all countries in the world today. In Nigeria, attention has not been paid to understand factors that associated with the outbreak and initial spread of the virus which made containment difficult. This study aimed at exploring the factors associated with the spread of Covid-19 in Nigeria and way forward for future epidemic preparedness. Data for the study were generated through an electronic literature search in PubMed/Medline, Google, Google Scholar, Scopus database, magazines, Newspapers, and grey literature focusing on the COVID-19 pandemic. The trends of the spread were assessed using graphs and bar charts. Factors such as Nigeria weak health system, porous border, lack of isolation centers, misinformation, conspiracy theory among others with its association to spread and containment challenges of COVID-19 were discussed. The study further presented its implications for future epidemic preparedness. Thus emphasizes the urgent need for Nigerian government to adequately equip health sector, properly kits health workers and equally establish isolation centers across the 36 states of the country. Also ensure better protection of trans-border migrations to eliminate further spread and contain future outbreak since all these viruses are been imported into the country.

Keywords: COVID-19 • Containment challenges • Factors associated with the spread • Future epidemic preparedness

Introduction

The COVID 19 outbreak which started in the Hubei province of China in the late December 2019 has assumed the new acme of life-threatening infection in the 21st century. The novel COVID19 which was declared a pandemic by World Health Organization (WHO) on the 11th March 2020, due to its devastating effect across countries globally is rapidly evolving and has affected over 210 countries, Nigeria inclusive [1]. From 31 December 2019 and as of 15 May 2020, that is four months and two weeks of the outbreak, over 4338658 cases of COVID-19 have been reported globally, with a total of 297119 mortalities [2]. In the African countries the COVID-19 outbreak in the region is not different hence the novel virus has continued to surge with 54190 verified cases and 1623 deaths within the four months of the outbreak in the region [3]. However, while many African countries were recording relatively fewer cases, Nigeria has 5445 confirmed cases and 171 deaths within the same period [4].

In Nigeria, the first confirmed case of the disease was detected on February 27, 2020, following the return of an Italian (male) to Lagos State airport on February 25, 2020, on a flight from northern Italy, and had subsequently traveled from Lagos to Ogun State, western Nigeria, where he became ill and was promptly isolated in Lagos [5].The outbreak of the novel virus in Lagos which is the biggest city in Nigeria with a very large population, triggered panic among the individuals and authorities in the country that the disease may circulate rapidly due to the Country's weak health systems. Nevertheless, the National Emergency Operations Centers (NEOC) following the report of the first case immediately commenced the trace of his contacts. The contact tracing report revealed that a total of two hundred and seventeen (217) persons had contact with the index case out of which, forty-five travelled out of Nigeria, while one hundred and seventy-two (172) remained in the country. Sixty-nine (69) out of the one hundred and seventy-two contacts (172) were found in Lagos, Forty (40) in Ogun state, fifty-two (52) in other states and eleven (11) in an unknown location [5].

In line with recommended practices, the contacts were subjected to COVID 19 test by the Federal Ministry of Health, and on March 8, 2020, one of the tested contacts to the index case was found to be positive. With this report the number of COVID 19 cases in Nigeria increased to two and thus marked the beginning of the spread of COVID 19 in the country. Consequently, as more tests were initiated more cases were reported in the country to the tone of 5445 confirmed cases and 171 deaths as at 15 May 2020 [4]. From this date the number of cases continued to grow exponentially as local transmission surged relative to the number of imported cases [5].

Sequel to the above sorry situation, the Federal Government of Nigeria initiated some of the major strategic responses to attenuate the spread of COVID-19 pandemic in the Country. The strategic measures includes declaration of lockdown in Nigeria on 30th March, 2020 as people were forced to maintain social distancing, regular hand washing and use of sanitizers, use of face mask in public and good reparatory hygiene [1]. Also as number of cases surged, other control measures were enforced such as closing the Nigerian borders and travel ban on 13 high-risk countries [6]. Again as some other states across the country reported the outbreak of the novel virus, various degrees of lockdown were also carried out in all the 36 state in the country. This lockdown directive involved the closing down of all schools, both primary, secondary, tertiary institutions and government

Table 1. The Major Containment Strategies Government Adopted to attenuate the spread of COVID-19 pandemic in Nigeria.

The Step-by-Step Strategies Adopted by Nigerian Government to Mitigate the Spread of Coronavirus (COVID-19) pandemic in the Country since the outbreak of the Index Case						
COVID-19 Outbreak	Step One	Step Two	Step Three	Step Four	Step Five	Step Six
First Confirmed Case on 27th March 2020	March9, Presidential Tasks Force for COVID-19 Commissioned	March18, Federal Govt. order for cancellation of national sports festival and suspension of the ongoing orientation course for the 2020 Batch 'A' corps members. March 19, closure of all the schools in the country [8].	March 19, Ban of gathering of not more than 20 and religious gathering of not more than 50 persons	March 30 Lockdown order was issued for Lagos, FCT & Ogun State	April 2, More state go into lockdown beginning from Bauchi State follows by other state in the country	March18, Travel Ban on 13 high- risk countries, March 23 international Flight Banned, April 20 domestic flight banned, May 6 domestic and international flight extended to June 7

parastatals. Also bans on religious and social gatherings involving more than 20 persons, restrictions on businesses activities, social distance plan for incoming travelers among others [7]. Within the fortnight of the previous restrictions another declaration came that there should not be any social gathering of any kind and due to this instruction, there were many cancellations of social events like burial, wedding, birthday, naming, congregational prayers, convocation ceremony. Also the institution of taskforce by both federal and state governments to ensure complete compliance, and to ensure that people in their respective states do not default the lockdown order as you can see in Table 1.

The main worry of this paper was to unveil those factors that militated against the effective control of the disease in the country especially at the early stages of its outbreak. This is important because COVID 19 is a deadly disease which spreads easily and can cause death of vulnerable people. From all indications the disease has come to stay and thus there is need to understand factors that impeded its control in the country. An understanding of these factors will open up the need for more effective means of combating the disease in the future. The federal government, NCDC and all other stakeholders who are responsible for the fight against COVID19 will find this study interesting, as this will present facts that will enable them understand those factors associated with the spread of the novel virus and containment challenges from the onset of the outbreak, hence plan better for the control of the novel COVID 19 pandemic and for future epidemics outbreak in the country [8-10].

Materials and Methods

This review was conducted using both peered reviewed and grey literature focusing on research evidences derived from COVID-19 pandemic especially in Nigeria. An electronic literature search was conducted in PubMed/Medline, Google, Google Scholar and Scopus database, including magazines and Newspapers from 28 February the index case was detected in Nigeria to 15 May 2020 as of this writing, to retrieve relevant articles for the study. The following keywords were used for the search: COVID-19 pandemic, causes of COVID-19 pandemic, factors influencing the spread of COVID-19, prevention and control measures of COVID-19, future epidemic preparedness, and search was limited to English language articles. Full text articles that provide information on the subject matter were fully evaluated. Reference lists of published articles (including documents on databases such as WHO, CDC, NCDC and ECDC) were scanned for potential data that was used for both graphs, bar chat and the text. The data were used to describe the trends of occurrence of COVID-19 in Nigeria, and factors associated with the spread and containment challenges. The lessons learnt were used to suggest for future epidemic preparedness. The narrative review method was chosen since this article sought to evaluate, summarize, and clarify literature on the factors associated with the COVID-19 spread and its containment challenges in Nigeria.

Literature Review

Epidemiological facts of coronavirus 2019 (COVID-19)

COVID-19 which belongs to the genus of coronavirus COVs, the family Coronaviridae, and Nidovirales, SARS, H5N1, H1N1 and MERS, is well known to have been occurring hence the current outbreak of COVID-19 is not the first time. Studies have observed that coronavirus causing an epidemic has been a significant global health threat. As in November 2019, an outbreak of Coronaviruses (CoVs) with Severe Acute Respiratory Syndrome (SARS)-CoV started in the Chinese province of Guangdong, also in September 2012 the Middle East Respiratory Syndrome (MERS)-CoV appeared [11-14]. The 21st-century SARS-COV-2, which is responsible for COVID-19 infection, has been the deadliest of the 21st century virus. The COVID-19 is a contagious respiratory illness transmitted through the eyes, nose, and mouth, via droplets from coughs and sneezes, close contact with infected person and contaminated surfaces. The time frame for its incubation is approximately 1 day to 14 days. The symptoms include cough, fever and shortness of breath, and it is diagnosed through a laboratory test [15]. The effect of COVID 19 could lead to serious health consequences such as breathing difficulties or fatalities, especially among the old and individuals with existing severe illnesses. Some individuals affected with the virus may not present any symptom but remain carriers of the virus while some show minor symptoms and then overcome the disease [16]. Studies have indicated that the transmission of COVID-19 was very fast regarding its transmission to different countries after its first appearance in China [17]. In Nigeria, the outbreak of the novel virus took a new dimension as at May 2020 when the NCDC reported an upsurge in the number of cases in almost all the states in the federation [14,18].

Graphical presentations of COVID 19 pandemic in nigeria by state and death rate during the first few months of the outbreak

The graphs above represented the data on the upsurge in the reported cases of COVID-19 day to day and death rate across the country (Figures 1-7). The graphs indicated that despite the control measures adopted by both Federal and State government to mitigate the spread of COVID-19 within four months, the novel virus continued to evolve rapidly in the country. World Health Organization (WHO) had warned that African countries including Nigeria stand a high risk of recording not less than two hundred and fifty (250) million cases and up to two hundred thousand (2,00,000) fatalities of COVID 19 if the disease is not adequately controlled [19-21]. These in the main have informed the decisions to examine

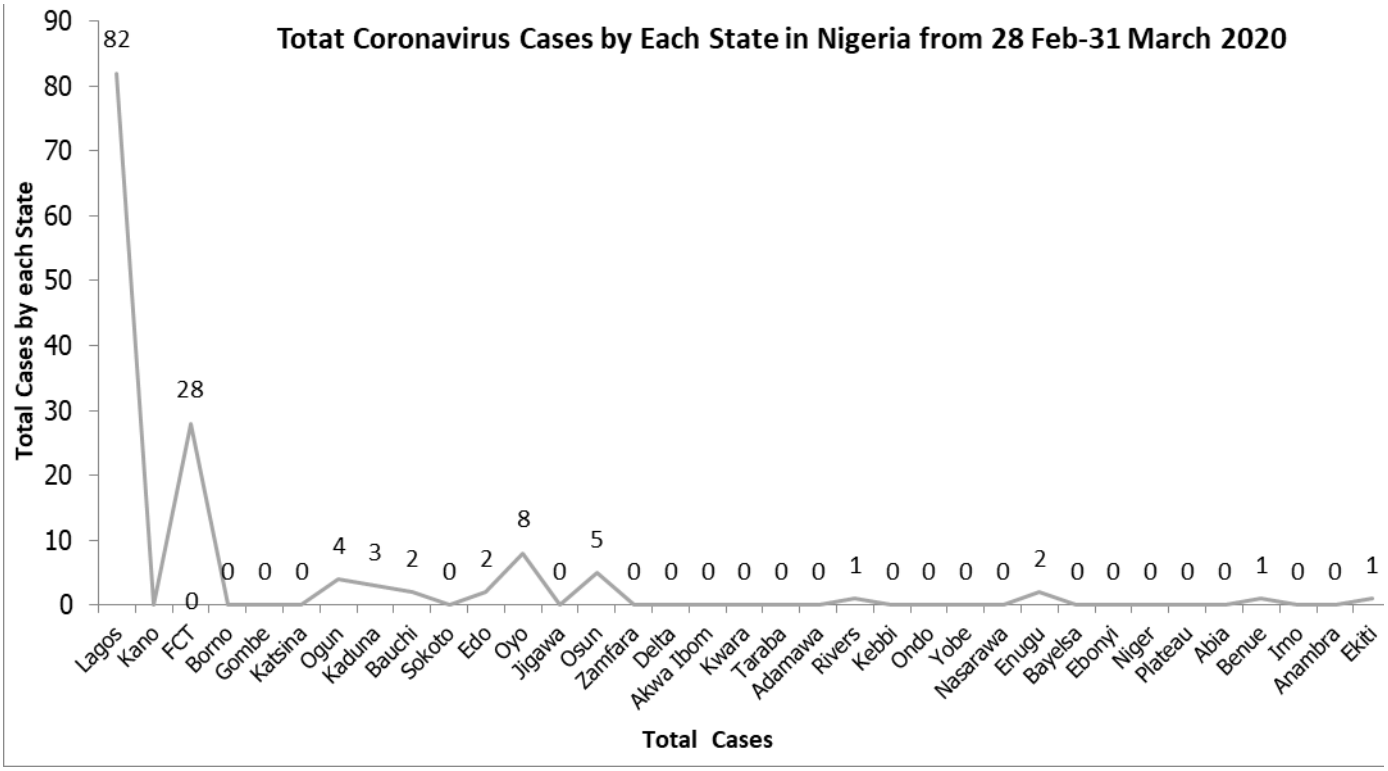

Figure 1. Total COVID-19 confirmed cases by each state in Nigeria starting from 28 February 2020, when the index case was recorded to 31 March 2020.

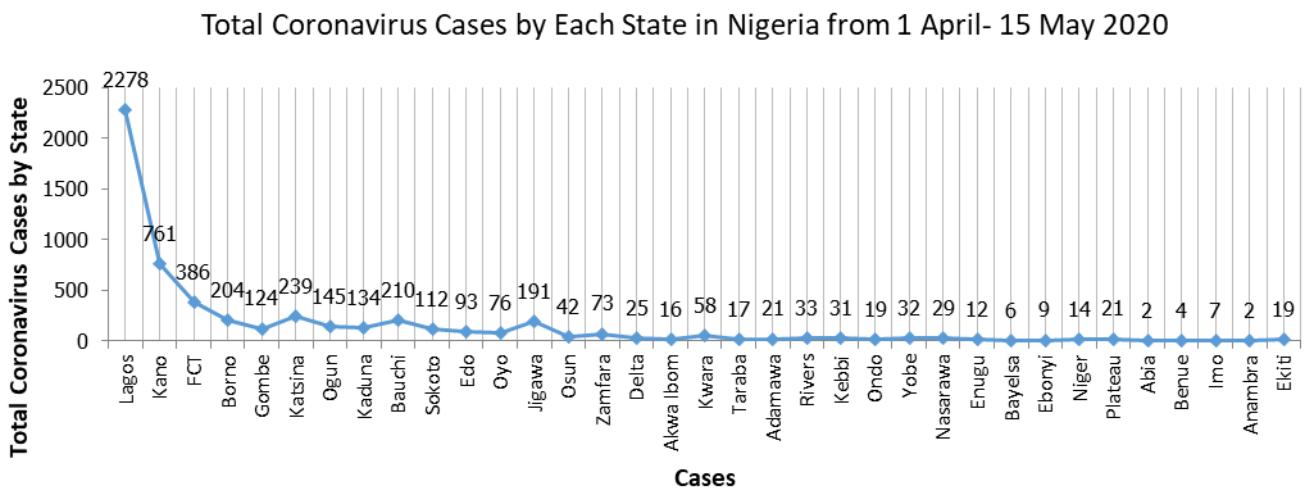

Figure 2. Indicated the cumulative growth of COVID-19 confirmed cases by each state in Nigeria starting from 1st April to 15 May 2020.

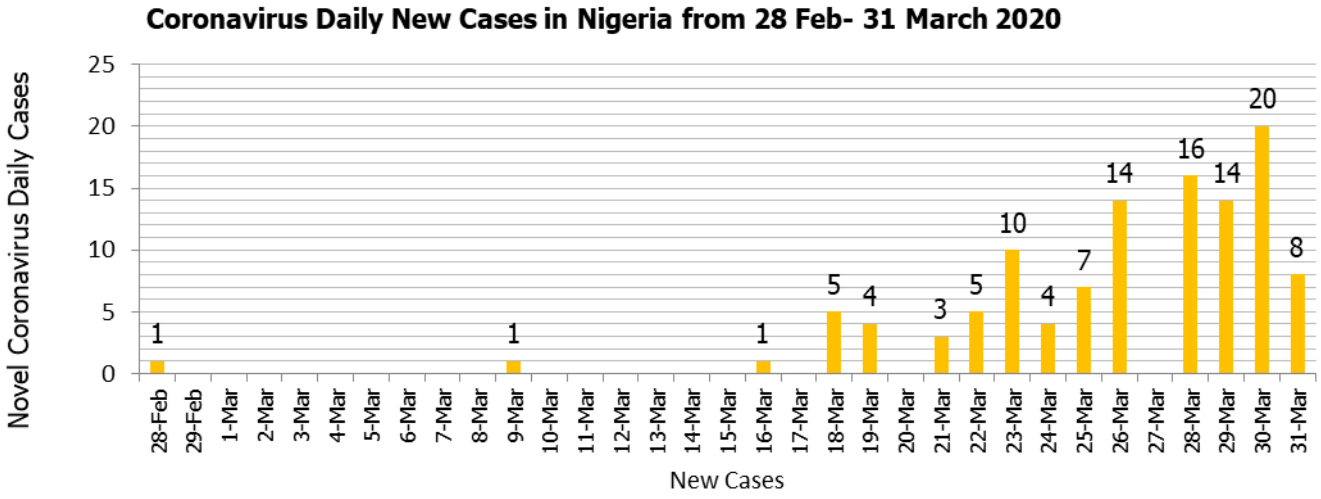

Figure 3. Daily New Confirmed Cases of COVID-19 in Nigeria from 28 February to 31 March 2020

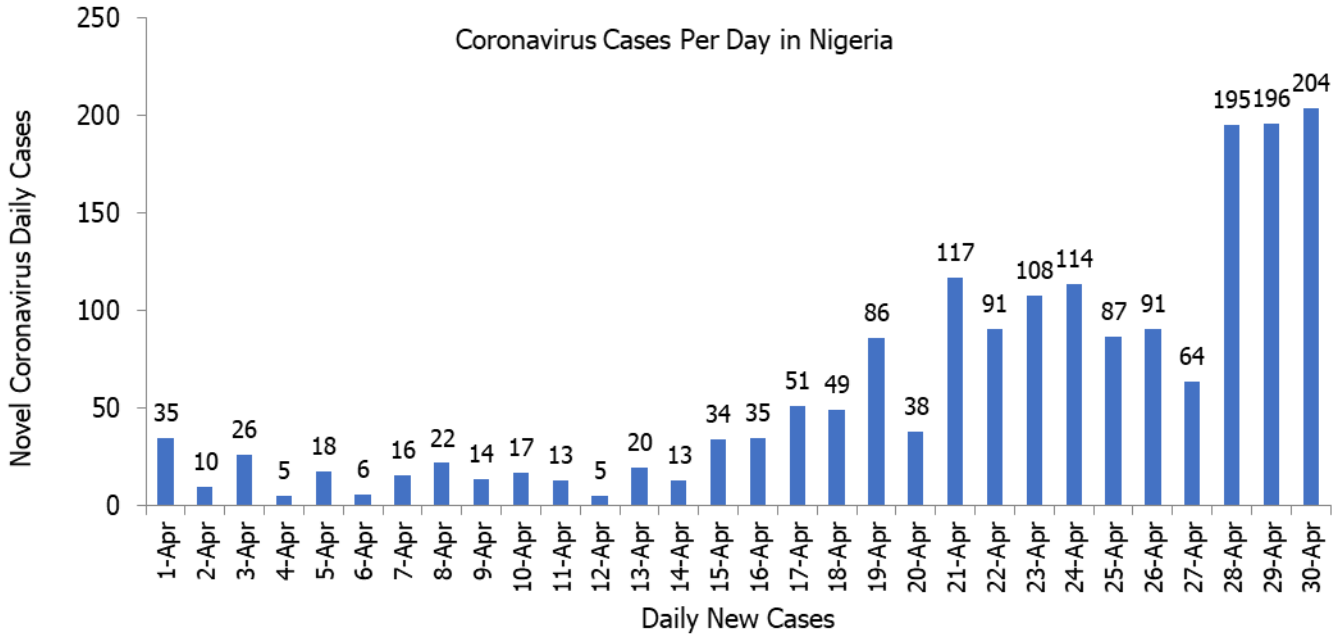

Figure 4. Daily new confirmed cases of COVID-19 in Nigeria from 1st April to 30 April 2020.

those factors associated with the spread and containment challenges of COVID-19 Pandemic in Nigeria. These factors are discussed sequentially under the succeeding subheadings:

Nigeria weak health system: Nigeria poor healthcare systems adversely affected the control of COVID-19 pandemic in the country. This is evidence as even before the COVID-19 in the country the health system was already challenged with numerous issues such as nonpayment of health worker's salaries and allowances, lack and poor condition of available health facilities and equipments, inefficient data transmission, incessant strike actions, lack of funding, insufficient training of healthcare workers, and divisions among health workers [22]. The Low standard administration and government lack of commitment towards issues surrounding the health sector may have increased the existed internal crisis among health workers, with a consequent rise in many groups that were involved in a

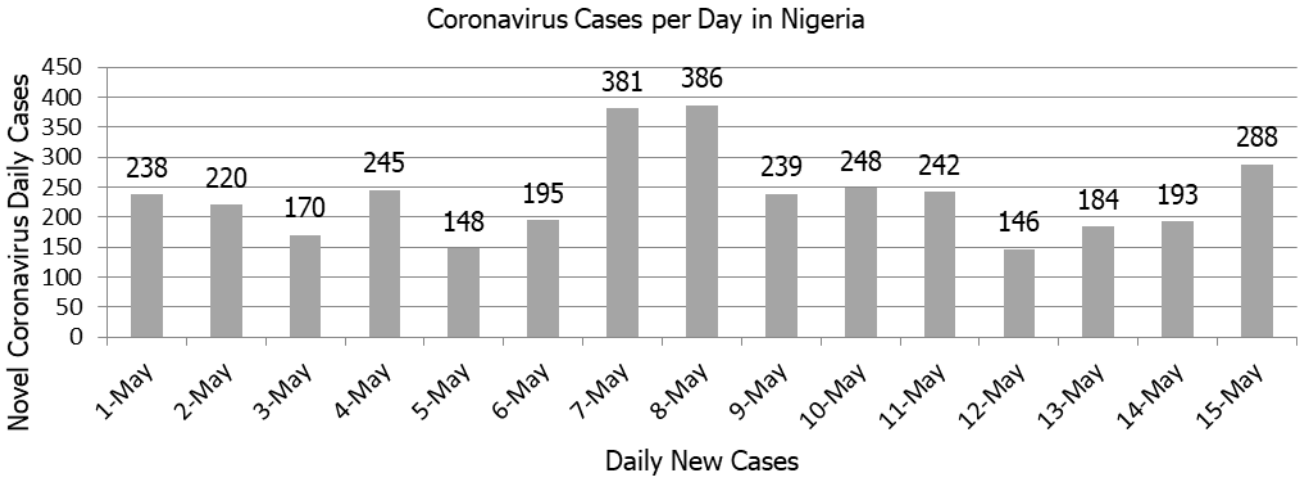

Figure 5. Daily New Cases of Confirmed COVID-19 in Nigeria from 1st May to 15 May 2020.

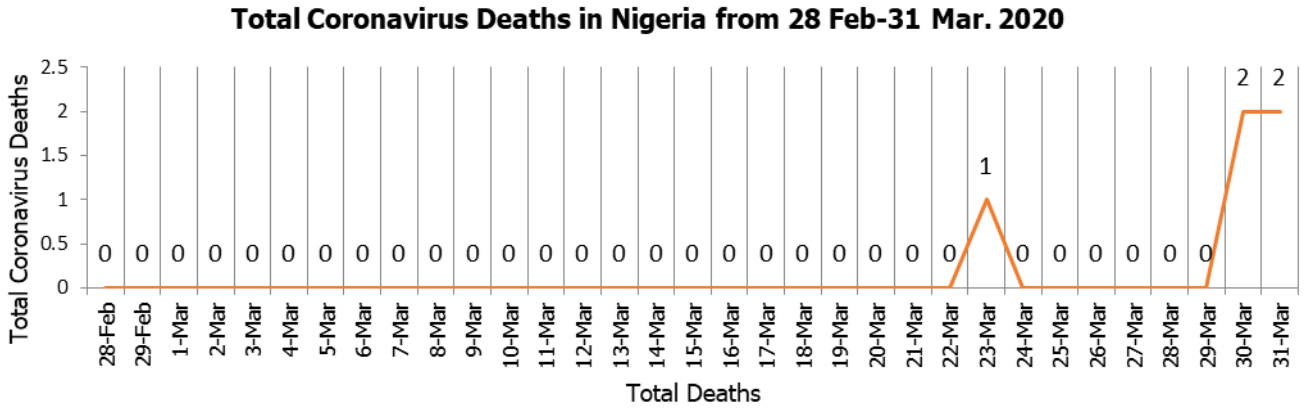

Figure 6. Total Coronavirus 19 (COVID-19) Deaths in Nigeria within 28 February-31 March 2020.

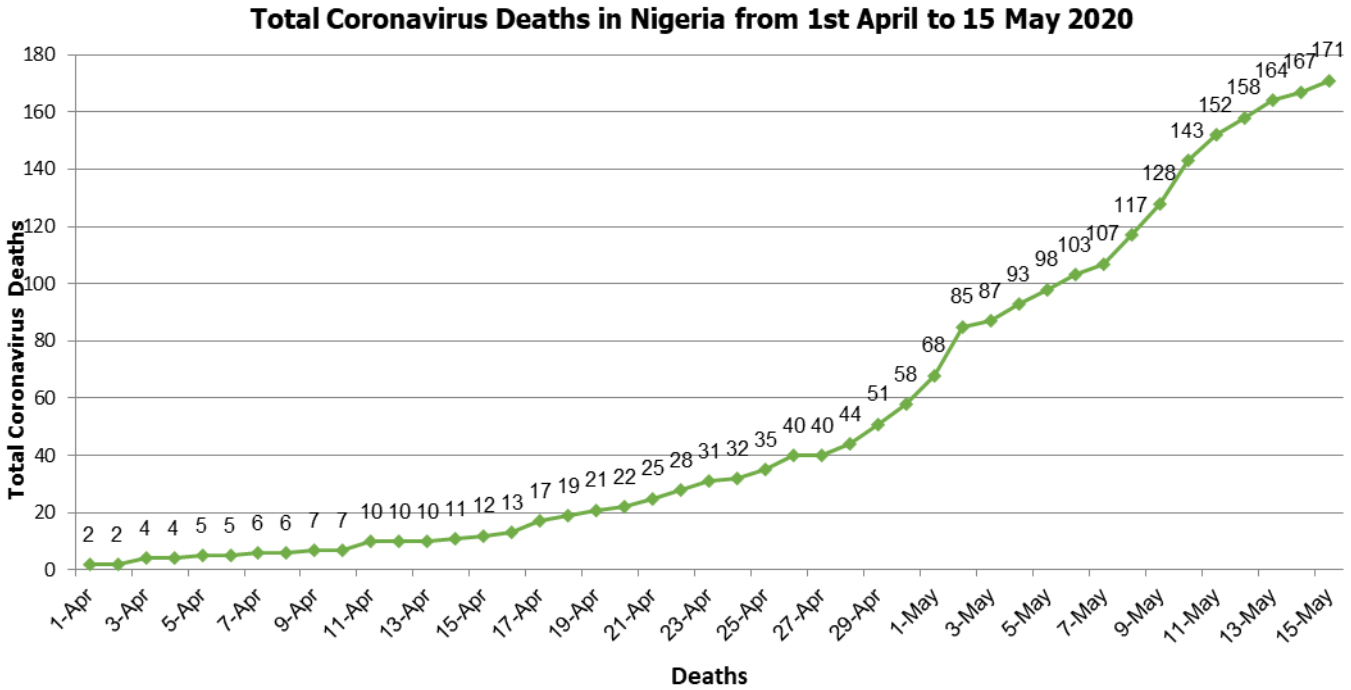

Figure 7. Total coronavirus 19 (COVID-19) deaths in Nigeria within 1 April - 15 May 2020.

prolonged power struggle. These crises perhaps contributed to the poor healthcare delivery services to Nigerians [22].

The prime position of Nigeria in Africa notwithstanding, the country still lacks proficiency in her health system. The Facilities and equipment's for health care are grossly not enough, particularly in non-urban areas [23-25]. Medical personnel in Nigeria had earlier speculated that the occurrence of the COVID-19 in the country might have serious implications as a result of a deficient health system. Even with this apparent fear, the federal Government is yet to comply with the 2001 agreement that fifteen percent (15%) of the countries budgetary allocation should be ascribed to the health sector. Report also shows that in 2008 only 3.9%of the country budget was assigned to health, while the budget in 2020 was minimally enhanced to 4.5%. Worse still available records reveal that the country has just 40,000 medical doctors who are to offer health services to a large group of persons that are more than 200 million. This number of doctors according to the WHO standard for physician to patient ratio is simply inadequate. The WHO standard requires that one doctor should care for one thousand patients and with the available medical personnel on ground it is obvious that the number is not up to half of the number required new health challenge due to COVID 19 pandemic [26]. The continuous increase in the number of COVID 19

reported cases in the country posed serious challenge for the limited number of doctors as more hands were needed in order to adequately care for the number of patients in isolation.

Porous border: The loose state of West Africa's boundaries including Nigeria, which is linked to careless way the colonial masters mapped out the African continent as well as the state of their management by post-colonial states, has become a source of concern especially as it regards to the outbreak of COVID-19 pandemic in Nigeria [27, 28]. Due to the rapid spread of COVID-19 across the globe, fears were growing over African countries especially Nigeria government ability to protect its citizens from the COVID-19 pandemic. This is evidence as Nigerian trans-border migrations including illegal migration, drug traffickers, money laundering, child trafficking, smuggling (food items, vehicles) were obvious and could spread the virus quickly to the country. The Federal Government has observed that the sudden hike in the number of COVID-19 transmission in the country was closely associated with the country's loose boundaries, with the speculation that there were higher transmissions in the eastern part of the country as individuals were found moving on foot across borders [29]. These land borders were ignored in all the noise about the COVID-19 outbreak and was possibly one of the sources of the infection in the country [30-38].

Misinformation, misconception, conspiracy theories (not believing in covid-19 pandemic): Just a few weeks of the emergence of COVID-19 in China, misleading rumors and conspiracy theories circulated on social media across the globe. In Nigeria for instance, when the index case was confirmed, conspiracy theories abounded that the government in the corruption-plagued country had made up the case to cash in on international funds. According to Damilola Banjo a Nigerian Investigative Journalist "Nigerians at the grassroots, where the majority live, think COVID-29 is a ploy by the government to 'steal' more money from the state coffers," "With the number of confirmed cases nearing 50, opinion polls indicated that the government was still struggling to share accurate COVID-19 information despite launching an extensive online campaign" [39]. An important aspect of the claim by majority of the people was the in ability of the government to disclose the name of the man from Italy who first brought the virus to Nigeria [39]. In other words, a recent Gallup-backed survey by NOI Polls showed 26% of Nigerians believed they were immune to the disease while some believed that the virus is programmed and meant for the riches and not for poor people. About 15% of the people thought that consuming ginger and garlic could offer some protective value against the virus. This scientifically unproven claim trended and circulated widely across Africa including Nigeria [27].

Nigerians were mostly affected by all these misinformation, disinformation, and rumors since the outbreak of COVID-19 pandemic in the country [40]. Misinformation or informedics is one consequence which may affect public trust in the medical profession and scientific research. This in turn would complicates an already difficult task, since it may lead to some people clutching at relatively accessible "solutions" instead of going for testing and medical treatment. Proposing and accepting untried and seemingly miraculous cures may hamper the medical management of patients with COVID-19, and maybe dangerous, even fatal [39].

Conclusion

The emerging and re-emerging infectious diseases have in recent years continued to constitute a global public health threat to human populations especially in Nigeria. Since 21st century there were successive waves of novel (Severe Acute Respiratory Syndrome (SARS), Ebola virus, Lassa fever and the present Coronavirus Disease 2019 (COVID-19) pandemic causing global public health crisis. Understanding the factors associated with the spread and containment challenges of this novel virus in Nigeria has become necessary, as this will help to assist government and other authorities to apply stiffer preventive measures to eliminate the virus and prepare for future epidemic that will emerge. The present study assessed many factors associated with the spread of COVID-19 pandemic and recommended that much attention should be paid especially in the areas of provision of personal protective equipment PPE, ventilators and isolation center and adequate funding of Nigeria health system to improve their testing capacity, and ensure that health workers are not unduly exposed to risks of infection in the course of providing care for patients. Also Nigeria government needs better protection of trans-border migrations in other to curb further spread of infections hence all these viruses are been imported to Nigeria from outside the country. There is also an urgent need for the government and other stakeholders to organize well-articulated evidence-based health campaigns, employing all necessary means of information dissemination, including traditional channels to address different forms of infomedics, misinformation, misconception, and conspiracy theory circulated around COVID-19 outbreak in Nigeria, which seriously affected the containment effort. Also there is need for the Nigerian government to improve on its containment measures according to the WHO guidelines as highlighted in the current study.

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None to declare.

Conflicts of Interest

The authors declare no conflict of interest

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