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## Sustainability Consciousness Integration into Healthcare Service Delivery in Gombe State, Nigeria

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### Abstract

Sustainable healthcare is becoming an increasingly prominent issue as the aspects and impacts of healthcare activities are acknowledged and discovered. The study aimed at assessing the sustainability consciousness integration into healthcare service delivery in Gombe State, Nigeria, through identifying macro-area's criteria that institute sustainability consciousness in healthcare sector in Gombe State, evaluating the path to sustainability consciousness for healthcare service demand and supply in Gombe State, and assessing the relationship of macro-area's criteria and the path to sustainability consciousness for healthcare demand and supply in healthcare sector in Gombe State. The study adopted a cross-sectional field survey research design with 90 professional health personnel as the sample size of the study administered with a validated and reliable ( $\alpha = 0.70$ ) questionnaire instrument for collecting the primary data of the study. Both descriptive and inferential statistics were used in analysing the study objectives with the used of SPSS version 23 software as a tool for data analyses. The study concluded that, environmental macro-area criteria with envelope technologies and social macro-area criteria with comfort are the highest important macro-area's criteria that institute sustainability consciousness in healthcare sector in Gombe State. Foster skill to create value-conscious consumers, promoting technology innovations that lower cost and leverage talent to raise quality, and implementing modern management and focus on performance are the three most path to sustainability consciousness for healthcare demand and supply in Gombe State. There was large positive significant relationship between the macro-area's criteria that institute sustainability consciousness and the paths to sustainability consciousness for healthcare demand and supply in healthcare sector in Gombe State ( $N=78$ ,  $r=0.631$ ,  $p<0.05$ ). The study recommended that, stakeholders and medical professionals need to create a serious awareness to the entire public for the paramount importance to shift utmost

attention to integrate sustainability consciousness in their dealings in healthcare sector, and more needs to be invest in healthcare sector so to increase clinical and technological performances in the sector. more statutory laws should be worked and put in place both locally, nationally, and globally to ensure more paths to sustainability consciousness for healthcare service demand and supply to achieve high quality of healthcare for all. Government and relevant stakeholders should buckle up and embark on a holistic approach with no sentiment that will encourage sanity in the healthcare sector and guarantee safety for all habitat which can ensure sustainability consciousness in healthcare.

## Keywords:

Concept of Healthcare Sustainability; Macro-Area's criteria and sustainability consciousness; Healthcare Sector and Service Delivery; Path to Sustainability Consciousness.

## 1.0 Introduction

Worldwide, healthcare is estimated to be a US\$ 7 trillion industry (OECD, 2009). There is now widespread agreement as an issue facing governments across the globe that all societies are facing the twin challenge of limited resources and an ageing population, which happen at different times in different countries (Scrutton, Holley-Moore & Bamford, 2015). In Europe, only 3% of healthcare expenditure is allocated to prevention and public health programmes, with some countries allocating as little as 1% (Van Sickle *et al.*, 2014). According to Nwakanma and Nnamdi (2013), United Nations Millennium Declaration that led to establishment of the Millennium Development Goals (MDGs) have positive impact on the developed countries, for instance, since the year 2000, life expectancy in the U.S.A. has maintained a continuous increase from 76.8% in 2000 to 78.7% in 2012, likewise, their U.K. counterpart, has improved from 77.7% in 2000 to 80.3% recently (2012). In 2016, according to Papanicolas, Woskie and Jha (2018) the US spent 17.8% of its gross domestic product on health care, and spending in the other countries ranged from 9.6% (Australia) to 12.4% (Switzerland), currently USA maintained US\$3675.3 billion as national health expenditure (Greenfield, 2018). Sweden spends about 35 billion euros (about US\$46 billion) annually on healthcare.

A hospital which is sustainable both in its structure and management is the only possibility to promote wellbeing and healthiness for people attending it (Buffoli, Capolongo, Bottero, Cavagliato, Speranza, & Volpatti, 2013), and this has to be considered both as a main requirement and a quality issue, since healthcare structures must be capable to deliver high standards also in changing circumstances. Healthcare delivery in Nigeria is both a private and government business, as the Federal and State government are allowed to set up hospitals and other health facilities (Darlynton, 2020). Effective healthcare delivery is usually a function of the quality, accessibility and affordability of the service (Darlynton, 2020). The healthcare delivery system of a nation hinges, amongst other things, on how well its hospitals can deliver qualitative and affordable healthcare to its citizens (Attah, 2017). Thus, the role of hospitals in the healthcare delivery system of a nation cannot be overemphasized (Ojo & Popoola, 2015).

There are four categories of sustainability factors which is: economic and financial factors; project design and implementation factors; the organization and management structure of the project; and the political and socio-cultural context in which the project will operate. Besides, sustainable healthcare service factors can be divided into contextual factors, activity profile, and organizational capacity. These factors are the main factors that determine how inputs are converted into outputs (Olsen, 1988). There is high approach of sustainability in developed countries, which complement the unprecedented series of advances—from antibiotics and vaccines to organ transplantation and robotic surgery—have revolutionized our ability to combat ill health (Land, Pang, Cheng, Chik, Poon, Poon, & Attar, 2008), also, by putting in place the infrastructure required to ensure that these advances can be delivered to those who need them. But in Nigeria, the issue of sustainability is dangling amidst the leaders, management and the patients who are the direct beneficiary of healthcare service as a result, death rates from heart disease, stroke, most infectious diseases and even some forms of cancer have been in the increase unlike in the developed countries which is on the decreased considerably, hence nearly doubled the life expectancy (Aghion, Peter & Fabrice, 2010).

According to World Health Organization (WHO, 2018), the integration of services can be achieved through a team of health and social professionals who are in close contact and engaged with individuals and the communities they serve. Integrated health services, based on strong primary care and public health functions, directly contribute to a better distribution of health outcomes and enhanced well-being and quality of life, which in turn bring important economic, social and individual benefits. Integrated care contributes to improved access to services, fewer unnecessary hospitalizations and readmissions, better adherence to treatment (Nolte & Pitchforth, 2014; Nolte & McKee, 2008),

increased patient satisfaction, health literacy and self-care, greater job satisfaction for health workers, and overall improved health outcomes (WHO, 2016; Nolte & Pitchforth, 2014; Dudley & Garner, 2011). There is also growing evidence of the effectiveness of integrated health services, particularly for the management of noncommunicable diseases and chronic conditions (WHO, 2016a; 2015). Integrated health services by design enhance equity; they encourage the selection of services based on the holistic needs of a given population and deliver many different types of care across the life course, from health protection and promotion and disease prevention to diagnosis, treatment, disease management, long-term care, rehabilitation and palliative care. This continuum of care is coordinated across the different levels and sites of care within and beyond the health sector (WHO, 2016; 2016a; Kodner & Spreeuwenberg, 2002). Such an integrated approach to services delivery is crucial for pursuing universal health coverage.

Consciousness refers to our subjective experience of being aware of our surroundings, thoughts, and feelings and it's the quality or state of being aware of something within oneself or in the external environment. Sustainable consciousness refers to a mindset and way of thinking that prioritizes the well-being of both humans and the planet, and sustainable consciousness organizations can contribute to a more equitable and environmentally conscious future (Asif, Searcy, Zutshi & Fisscher, 2013). However, Lankoski (2016) asserts that, integrating sustainability consciousness into healthcare service delivery, organizations can improve patient care, reduce costs, and contribute to a healthier environment as numerous benefits are bound to be derived as follows: improved environmental health through reducing environmental impacts can lead to better health outcomes; cost savings as sustainable practices can reduce energy consumption, waste, and operational costs; enhanced patient care as sustainable healthcare facilities can improve patient satisfaction and health outcomes; increased efficiency as streamlined processes and reduced waste can improve healthcare service delivery; positive reputation as demonstrating sustainability can enhance the reputation of healthcare organizations. According to Rodríguez-Olalla and Avilés-Palacios (2017), organisations have become interested in using integral management systems to increase their sustainable value even though global integration models address sustainability in organisations, these models present shortcomings and limitations and do not describe how to achieve the integration of sustainability.

However, a healthcare organization globally is the only type of company which generates all existing classes of waste, where 20% is dangerous, being infectious, toxic or radioactive in nature; aside this, healthcare organization should encourage economic, social and environmental sustainability, so as to set standards for corporate social responsibility (Carnero, 2015; WHO, 2014). According to Buffoli *et al.* (2013), healthcare structures also play a significant role which are supposed to protect and improve public health, but in the meanwhile they are socially and environmentally impactful structures which can cause negative side effects on the people's health and on the background; whereas, a sustainable structure is a structure that can be easily maintained and that can be functional from the environmental, social and economic point of view, in order to comply with the diverse interests and needs of all the stakeholders (Buffoli, Nachiero & Capolongo, 2012).

## 1.1 Statement of the Problem

Nigeria's healthcare system has been bedeviled by lack of adequately trained personnel available to carry out medical work as well as lack of required medical equipment needed to aid the delivery of qualitative healthcare. Over the years, there has been a rise in Nigeria's poverty level. Also, Abiola *et al.* (2019) stated that, the ability to afford basic healthcare for common illnesses by the average Nigerian reduced drastically and in more extreme illnesses, citizens had to resort to sale of personal effects and/or real property, rely strongly on personal savings and/or resort to taking loans in order to be able to attend to their health needs adequately. It was confirmed that the underfunding of health sector below 15% (Muftaudeen & Bello (2014). The current expenditure of health sector now is 4.1% (Nigerian Budget, 2018). While, Gombe State the area of the study, invest an approximate of 3.04% of its budget expenditure (Gombe State Budget, 2018), despite numerous challenges in the healthcare sector in the state.

With many Secondary Healthcare facilities (General Hospitals) in Nigeria without sustainability plans, healthcare delivery is sometimes impaired with the current use of temporary cards. The upsurge in the number of patients daily seeking for healthcare services requires a fast and efficient sustainability plan to be absolutely in place. This is one of the driving forces behind the research into the integration of sustainability consciousness into healthcare service delivery in a Nigerian Secondary Healthcare facility.

Adinma and Adinma (2010) detailed that the Nigerian health system is characterized by unceasing under funding, which has resulted in poor performance of the health sector evident from Nigerian's poor reproductive health indices. However, strengthening service delivery is crucial to the achievement of the health-related Millennium Development Goals (MDGs), which include the delivery of interventions to reduce child mortality, maternal mortality and the burden

of HIV/AIDS, tuberculosis and malaria (WHO, 2010). This was the intend of this research to assess the sustainability consciousness integration into healthcare service delivery in Gombe State, Nigeria.

### 1.3 Objectives of the Study

The study aimed at assessing the sustainability consciousness integration into healthcare service delivery in Gombe State, Nigeria, through the following specific objectives:

- i. To identify macro-area's criteria that institute sustainability consciousness in healthcare sector in Gombe State.
- ii. To evaluate the path to sustainability consciousness for healthcare service demand and supply in Gombe State.
- iii. To assessing the relationship of macro-area's criteria and the path to sustainability consciousness for healthcare demand and supply in healthcare sector in Gombe State.

### 1.4 Research Questions

- i. What are the macro-area's criteria that institute sustainability consciousness in healthcare sector in Gombe State?
- ii. What is the path to sustainability consciousness for healthcare demand and supply in Gombe State?
- iii. What is the relationship between the macro-area's criteria and the path to sustainability consciousness for healthcare demand and supply in healthcare sector in Gombe State?

## 2.0 LITERATURE REVIEW

### 2.1 Concept of Healthcare Sustainability in Nigeria

Quality healthcare is one of the most important factors in how individuals perceive their quality of life. In most countries, alongside the economy, it is the major political issue while in some countries, the healthcare delivery organization is a part of the national identity. The healthcare delivery system of a nation hinges, amongst other things, on how well its hospitals can deliver qualitative and affordable healthcare to its citizens (Attah, 2017). Thus, the role of hospitals in the healthcare delivery system of a nation cannot be overemphasized (Ojo & Popoola 2015). Furthermore, the health care sector in Nigeria remains feeble, as seen in the paucity of organisation, disintegration of services, scarcity of resources, insufficient and declining infrastructure, and inequality in resource circulation (Osain, 2011). Thus, healthcare consumers have extremely greater expectations and as such they require an extraordinary level of care, consistency, sensitivity and compassion (Ndubisi, 2014).

A key development in linking health to the other economic, social and environmental aspects of sustainable development was the World Summit on Sustainable Development (Johannesburg, South Africa, August 26 - September 4, 2002). At the summit health was singled out as one of five priority areas, along with water, energy, agriculture and biodiversity, and was devoted a separate chapter in the resulting Plan of Implementation, which highlighted a range of environmental health issues as well as issues relating to health services, communicable and non-communicable diseases (Johannesburg, South Africa, August 26 - September 4, 2002). Following the summit, the Healthy Environments for Children Alliance (HECA) was launched by the WHO in conjunction with a number of other United Nations (UN) agencies, NGOs and governments.

Augustine (2016) posed that factors that enhance healthcare delivery in increasing access to health consumers: collaboration among health workers, adequate healthcare personnel, health ICT Education and Training for healthcare personnel, adequate incentives for healthcare personnel, a good health information system for health records keeping, technical quality of communication network, good software to enhance data collection, community support and participation, availability of adequate medical supplies and equipment, and ability of patients to pay for healthcare services.

Sustainability in healthcare is not a one-man affair, and for it to be successfully achieved as Ling *et al.* (2012) asserts that leaders, public, patients, staff and other organizations must play their important roles where the leaders become the central who set the tone and strategic direction. Over the last decade, there has been an increased pressure on organizations to focus on sustainability and accountability in business performance beyond that of financial performance (Lee & Saen, 2011). The objective of a sustainable measure is to assess corporate contribution to sustainability comprising environmental, social, and economic (Lawrence, 1997). Sustainability performance defined as the performance of a company in all dimensions and for all drivers of corporate sustainability (Schaltegger & Wagner, 2006; Sebhatu, 2008). In 2000 according to World Health Organization (WHO, 2000), Nigeria's overall health system

performance was ranked 187<sup>th</sup> position among 191-member States. Primary Health Care (PHC), which forms the bedrock of the national health system, remains exhausted due to the following: gross under funding, mismanagement, corrupt practices, and, lack of capacity at the local government level.

A number of efforts were projected in order to sustain the Nigeria healthcare system ranging from the Ward Minimum Health Care Package (WMHCP, 2001), Global Health Initiative (GHI, 2010–2015) and the National Strategic Health Development Plan (NSHDP, 2010–2015) as follows: attainment of Health for All Nigerians through the Primary Health Care, strengthening the national health system through the primary health care (PHC) approach, increasing economic productivity, sustaining national development and gender equality, improving access to commodities, strengthening partnerships and research for health as the building blocks of a functional health system.

Good health is one of the fundamental human rights everybody is entitled to enjoy. And the onus rests on the healthcare system to provide health services at the three tiers of the government (federal, state and local government). A health system can then be said to be an organization of people, institutions, and resources that deliver health care services to meet the health needs of target populations. Frenk (2010) suggested that health system planning should be distributed among market participants, governments, trade unions, charities, religious, or other coordinated bodies to deliver planned healthcare services targeted to the populations. WHO (2000) identified three basic goals of a healthcare system which include: good health i.e., improvement and protection of the health of the populace, fair financial contribution i.e., receiving the services paid for, and responsiveness of the healthcare providers i.e., living up to the people's expectation.

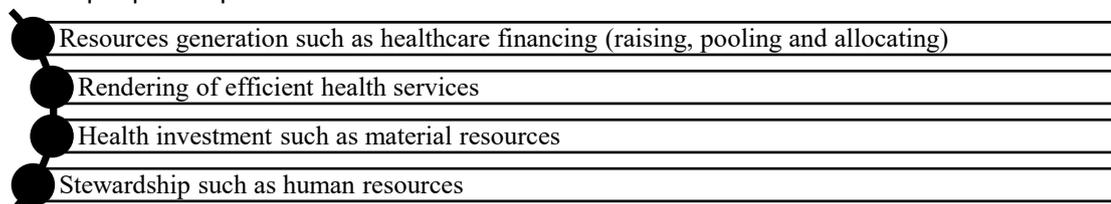


Figure 1: Functions carryout in order to achieve the three basic goals of healthcare systems  
Source: WHO (2000)

### 2.1.1 Macro-Area's Criteria and Sustainability Consciousness in Health care Industry

This study is modelled on the theory of Sustainability as promoted by Barbier (1987). The main concept of sustainability focuses on the interaction between a given project and the environmental, economic and the social dimensions of the system enclosing it. It is evident that there is a relationship between promoting the concept of sustainability in one of its dimensions and its propagation to the other areas of sustainability (Ma, 2011; Abdel-Raheem & Ramsbottom, 2016). The theory of sustainability as explained by Barbier (1987), that to effectively achieve sustainability the goals across all the dimensions, aspects that constitute sustainability most be maximized as illustrated in figure 3 below by the shaded area in contrast to conventional healthcare development approaches which tends to only maximize economic dimensions. He further explained that Marxist economics approach only maximizes economic and social dimensions of sustainability, in contrast Cowell *et al.* (1997), stated that the term 'sustainability' is used to describe the theoretical situation when all dimensions of sustainability are systematically integrated as indicated in the shaded area in the diagram. The triple bottom line approach to sustainability is the cornerstone of sustainable healthcare service process where all the pillars of sustainability are incorporated into the building an effective healthcare service delivery to the teaming population in need of such services. Even though, Szekely and Knirsch (2005) stated that there are two types of factors favoring the adoption of a sustainable approach in healthcare industry which are internal and external factors.

According to Fairfeild *et al.* (2011), there are four types of sustainability practice; through environmental, workplace, product and service development, and stakeholder engagement. Some of sustainable practices are focused on improving eco-efficiency and reducing environmental pollution by energy preservation, using the renewable and local energy resources, and reduction of pollution and waste. Besides, other practices are focusing on worker's health and safety, employee engagement, work-life balance, civic volunteerism, and ethical governance, while slowly applying sustainability criteria into talent and performance management systems. Jameton and McGuire (2002) also suggest that sustainability involves balancing three factors which are patient care, economic concerns, and environmental cost. Also, Lieberston *et al.* (1985) in one of their research projects in Gambia, identified several factors that influencing the sustainability of the Mass Media and Health Practices, which includes four categories of sustainability, factors i.e., organization and management structure of the project; and, the political and socio-cultural context in which the project

will operate. Besides, sustainable healthcare service factors which can be divided into contextual factors, activity profile, and organizational capacity.

This study adapts the revised concept of sustainability as it relates to building procurement process Barbier (1987) and Cowell *et al.* (1997). The concept identifies and examines dimensions of sustainability which is environmental, social, and economic and its set of collaborations that needs to be considered in building procurement process. For a sustainability consciousness to be achieved, so many factors must come into play and each factor with its exceptional set of collaborations; in this research work the factors that constitute sustainability consciousness will be considered under the three dimensions of sustainability which include:

- i. Environmental dimension,
- ii. Social dimension, and,
- iii. Economic dimension.

In healthcare industry, sustainable development of a healthcare sector incorporates the major principles of sustainability with respect to the environment, economic and the society, conditions through the various stages of healthcare service delivery, as the SDU believes that operating within the right economic, social and environmental boundaries will create a truly sustainable national health service (NHS) and one that is fit for the future. Smith (2012) stated clearly that the concept of sustainability for business now includes both environmental and social aspects as the health care has performance, environmental, operational and management standards like any industry. In the NHS, sustainable development is often partnered with good corporate citizenship, this means that the NHS can use its organisations' corporate powers and resources in ways that benefit rather than damage the economic, social and physical environment in which we live (NHS-SDU, 2009).'

These stages are not limited to but will include professional training, health profession, responsibility of the health professionals and the quality patient care; when sustainability consciousness is integrated in all these stages, sustainability will be achieved at the end of the healthcare. Like in construction industry, Yudelson (2009); Robichaud and Anantamula (2011) suggested that sustainability goals and project priorities must be considered seriously in the planning process of the early stage of project development. Therefore, in any healthcare service delivery, sustainability should always be the watch word for all the health personnel.

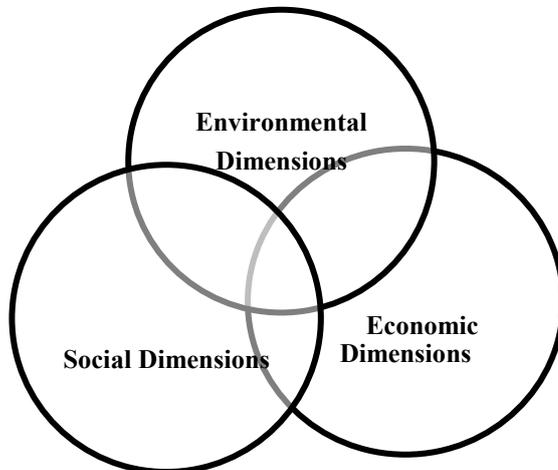


Figure 2: The concept of triple bottom line

Source: Adapted from Barbier (1987) and Cowell *et al.* (1997).

According to Nurul, Noor, Nurul, Naimah and Nur (2013), the word 'sustainable' has been a concern since the 1980's; as asserted by Hannon and Callaghan (2011); Smith (2012) that sustainable issues are now a top priority for most companies no matter non- profits, venture capital, or governments, all are increasingly sought to engage sustainable in their company. A typical source to define 'sustainable' is from a report at World Commission on Environment and Development (1987), which states that development is sustainable when the development meets the present needs without affecting the capability of next generation to meet their own needs.

**i. Environmental Dimension:**

The environmental dimension is comprised of four components: pollution, water consumption, waste management and land use (Domingo, Víctor-Raúl & José-Luis, 2015). In the same way, the Environmental area deals with themes like energy, water, waste, materials and urban planning (Capolongo, Battistella, Buffoli, & Oppio, 2011). Improvement of hospitals' overall sustainability are to be thorough evaluated of the fundamental and interconnected sustainability

macro-areas, the economic, environmental and social one, is achieved by means of a C&I (criteria and indicators) framework, used by many governmental agencies and academic researchers to carry out sustainability monitoring and evaluating programs (Buffoli, Capolongo, Bottero, Cavagliato, Speranza, & Volpatti, 2013; Yigitcanlar & Lönnqvist, 2013). Indicators are built to respond to the SMART (Specific, Measurable, Attainable, Relevant and Time-sensitive) logic (10) and to allow the comparison of different healthcare structures and the evaluation of over-time changing performances, by periodical measurements (Buffoli *et al.*, 2013).

**ii. Social Dimension:**

Domingo *et al.* (2015) asserts that social comprised of four components: health, education, safety, and culture; are the sustainability dimension. Social dimension is shaped on criteria regarding humanization, comfort (Baglioni & Capolongo, 2002; Origgi, Buffoli, Capolongo & Signorelli, 2011); and space distribution (Buffoli *et al.*, 2013). Various indicators allow then to specify each criterion, by establishing a clear link, from the theoretical and philosophical sphere to the concrete one. So, the indicators point out practical, measurable standards and possible solutions. Therefore, they may differ, as well as the criteria (even if more slightly), according to the typology of healthcare facility toward which the sustainability evaluation system is addressed.

**iii. Economic Dimension:**

The Economic macro-area includes criteria concerning factors which directly affect the economic sphere, but of course can also have effect on, and be influenced by, criteria included in different macro-areas. These factors relate mainly to managerial, technological and clinical aspects (Buffoli *et al.* 2013). According to Buffoli *et al.* (2013), for the stakeholders to be sustainability conscious, instead, as resulting from numerous surveys and meetings, require:

- i. An increased level of humanization inside the hospital, both for users and staff, since an effective treatment in most of the cases cannot prescind from comfortable spaces and positive work environment.
- ii. Higher attention to available resources: the hospital is a high-energy-demanding structure and consumes significant amounts of resources, which are finite and limited in time.
- iii. Widely spread multidisciplinary: sustainability is a holistic concept, made up by several elements, tightly entangled; so, the achievement of an objective cannot be reached leaving aside the understanding of each single issue, but the whole complex matter has to be analyzed.

## 2.2 Healthcare Sector and Service Delivery

Brody (2007) asserts that other dimensions for the evaluation of health systems include: quality, efficiency, acceptability, and equity. They have also been described in the United States as “the five C’s”: Cost, Coverage, Consistency, Complexity, and Chronic Illness.

There was a debate about the healthcare system with the way the development is going at a slow phase. Oyibocho, Irinoye, Sagua, Ogungide–Essien, Edeki and Okome (2014) assert that, Nigeria as a nation operates a pluralistic healthcare delivery system (i.e., orthodox and traditional health care delivery systems). Orthodox healthcare services provided by both private and public sectors. However, the provision of healthcare in the country remains the functions of the three tiers of government: the federal, state, and local government. The primary health care system is managed by the 774 local government areas (LGAs), with support from their respective state ministries of health as well as private medical practitioners. The secondary health care system is managed by the ministry of health at the state level. The tertiary primary health care is provided by teaching hospitals and specialist hospitals. Adeyemo (2005) posed that both the secondary and tertiary levels, also work with voluntary and non-governmental organizations (NGOs), as well as private practitioners. As at 2005, a total of 23,640 health facilities in Nigeria were estimated by the Federal Ministry of Health (FMOH): with primary health care facilities constituting 85.8%, secondary at 14% while tertiary at 0.2%; and out of these facilities 38% is owned by the private sector, which provides 60% of health care in the country. In spite of the availability of this huge number of healthcare facilities and advancement in technology the health sector in Nigeria has witnessed various turbulent with its attended negative effects. As affirmed by Obansa and Orimisan (2013), with the country’s teeming population now estimated at over 150million, it is still struggling with the provision of basic health services.

While at the other hand, Andersson (2011) posed that, the health systems have been a great success in the past century, fostering longer, healthier lives and thereby contributing to prosperity and economic growth (Andersson, 2011). These gains have come at a price, however, Organisation of Economic Co-operation and Development countries have seen healthcare costs consistently outgrow the economy for decades, although this trend has long been recognized as a significant challenge, the recent fiscal crisis and demographic shifts have suddenly brought it closer (OECD, 2011). In the past century, an unprecedented series of advances – from antibiotics and vaccines to organ

transplantation and robotic surgery – have revolutionized our ability to combat ill health. Most economically developed countries have put in place the infrastructure required to ensure that these advances can be delivered to those who need them. As a result, death rates from heart disease, stroke, most infectious diseases and even some forms of cancer have decreased considerably. Over the course of the past century, life expectancy has nearly doubled (Aghion, Peter & Fabrice, 2010). In a study by Jayal *et al.* (2010); Gunasekaran and Spalanzani (2011) and, Zubir, Habidin, Conding, Jaya and Hashim (2012) they found that some countries in Asia Pacific and the United States started to recognize the economic, social, and environment as the factors that contribute to the sustainable in manufacturing industry.

For many developing countries (Nigeria inclusive), health systems are currently a vital enabler of growth, providing the same benefits (i.e., improved quality of life, increased labour productivity and economic expansion) that wealthier countries derived so forcefully from their health systems in the 20<sup>th</sup> century. Expanding their health systems will help developing countries improve outcomes and access, and increase their competitiveness. Developing countries appear to be following the same trajectory of expenditure growth that OECD countries have followed, but the financial sustainability of their health systems may not be a serious issue for them in the near to medium term (OECD, 2011).

Obansa and Orimisan (2013) identified the following among others as the factors affecting the overall performance of the Nigerian healthcare system: inadequate health facilities/structure, shortage of essential drugs and supplies, inadequate supervision of the healthcare system, poor human resources, management, remuneration and motivation, lack of fair and sustainable health care financing with very low per capita health spending, unequal economic and political relations, neo-liberal economic policies of the Nigerian state and corruption, high out-of-pocket expenditure in health by citizens, absence of community-based integrated system for disease prevention, surveillance and treatment.

It became very necessary to brainstorm and come up with plans and strategies that will checkmate the aforementioned factors that militate against effective health care system in the country. Obansa and Orimisan (2013), highlighted some strategies among others which will help to tackle the health sector challenges in the country is illustrated in the figure 2 below:

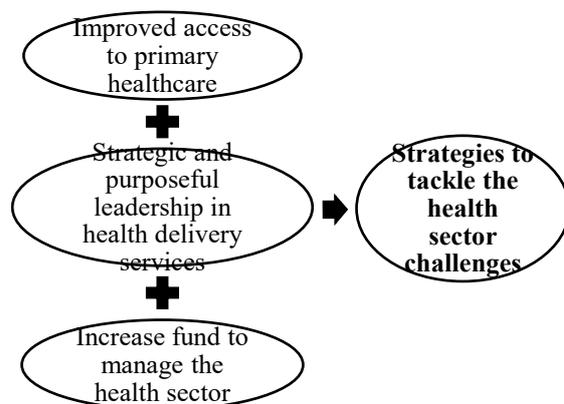


Figure 3: Strategies to tackle the health sector challenges

Source: Adapted from Obansa and Orimisan (2013).

### 2.3 Path to Sustainability Consciousness for Healthcare Service Demand and Supply

Sustainable healthcare is becoming an increasingly prominent issue as the aspects and impacts of healthcare activities are acknowledged and discovered (Smith, 2012). Healthcare organizations have complex internal and external roles as they have responsibilities to society, with a priority on quality patient care, still function as a business with inputs and outputs operating similarly to large-scale factories. Keeping path to sustainability consciousness in healthcare sector, the healthcare services can reduce their environmental footprint, improve patient care, and contribute to a more sustainable future (WHO, 2017), as the path to sustainability consciousness for healthcare service demand and supply involves several steps which are awareness and education regarding the environmental, social, and economic impacts of healthcare services (WHO, 2017); assessment and monitoring the environmental footprint of healthcare services, including energy consumption, water usage, and waste generation (SDG, 2019); sustainable procurement by implementing sustainable procurement practices, such as purchasing environmentally friendly products and services (WHO, 2017), improving energy efficiency in healthcare facilities through the use of renewable energy sources and energy-efficient technologies (IEA, 2020);

implementing effective waste reduction and management strategies including recycling and proper disposal of hazardous waste (WHO, 2019); implementing sustainable water management practices including water conservation and efficient use of water resources (WHO, 2019); engaging with the local communities to promote sustainability and environmental health (WHO, 2017).

Healthcare represents an enormous sector of society, economically, socially and environmentally (Smith, 2012). Hannon and Callaghan (2011) stated that, sustainability issues are being prioritized with every passing year; corporations, non-profits, venture capital, and governments are increasingly becoming involved in sustainable development efforts with acknowledgment of our ecological decline. Ensuring healthy lives for all at all ages represents the third goal of the global Sustainable Development Goals (SDGs) which were endorsed by the UN in 2015, after the MDG era. Despite efforts to increase access to quality health care, most of the world’s population found in rural and remote areas still has challenges accessing health care. Andersson (2011) in some of his interviews with experts identified the top seven most promising areas for potential productivity improvement that may be the paths to sustainability health systems must find:

- i. Reinvent the delivery system with new models of care i.e.
  - Deliver high-quality care in capital-light settings and low-cost channels; and,
  - Leverage patients to do more for their care – e.g., at-home healthcare like online banking.
- ii. Proactively reach out to predict and prevent ill health and manage disease i.e.
  - Assign ownership of primary and secondary Prevention; and,
  - Manage disease to reduce lifetime costs.
- iii. Promote technology innovations that lower cost and leverage talent to raise quality i.e.
  - Use incentives and regulation to focus technology on both cost-efficiency and enhancement; and,
  - Use the digital revolution to maximize the productivity of healthcare workers.
- iv. Foster skill and will to create value-conscious consumers i.e.
  - Patients and populations should be empowered with the right information, at the right time; and,
  - Use patient incentives to make doing the right thing.
- v. Implement modern management and focus on performance i.e.
  - Redesign lean processes and management practices; and,
  - Manage service-line Performance.
- vi. Pay for value, not for volume i.e.
  - Realign incentives of payers and providers to pay for the holistic care of whole populations or patient pathways.
- vii. Measure value and invest for the greatest returns i.e.
  - What cannot be measured cannot be improved; and,
  - Apply an investor mindset to resource allocation.

### 3.0 METHODOLOGY

Gombe State was the study area, a state in the northeastern Nigeria located between latitudes 10° 15'0" N – 10° 20'00" N and between longitude 11° 05' 00" E – 11° 15'05" E directly within the vast savannah region (Birna, 2016). A cross-sectional field survey was adopted as the research design for the study because it involved collection and analyses of data in numerical form, to help analyse data to be obtain to answer the research questions, which are descriptive and inferential. 90 healthcare professionals (personnel) were used as the population of the study drawn from the 18 public secondary health facilities in Gombe State with 5 top management in the healthcare profession [(1-Chief Medical Director) & 4-Head of Departments (HOD's)] as shown in table 1 below.

**Table 1: Population per each public secondary health facilities**

Name of LGA	Name of public secondary health facilities	Facility No	Population
Akko	Kashere General Hospital	0026	5
	Kumo Gen. Hospital	0038	5
	Pindiga General Hospital	0051	5
	Tumu General Hospital	0067	5
Balanga	Bambam General Hospital	0007	5
	Potuki General Hospital	0015	5

	Talasse General Hospital	0033	5
Billiri	Billiri General Hospital	0018	5
Dukku	Dukku General Hospital	0036	5
Funakaye	Bajoga General Hospital	0015	5
Gombe	Specialist Hospital Gombe	0020	5
Kaltungo	General Hospital Kaltungo	0014	5
Kwami	General Hospital Bojude	0003	5
	General Hospital M/Sidi	0042	5
Nafada	Jolle Dispensary	0024	5
Yamaltu/Deba	Deba General Hospital	0001	5
	General Hospital Hina	0017	5
	Zambuk General Hospital	0062	5
<b>TOTAL</b>	<b>18</b>	<b>-</b>	<b>90</b>

Source: Gombe State Health Facility Listing (2018).

In social research, studying the entire population of less than 100 as the sample size of a study ensure the findings are representative of the population thus, enhancing internal validity (Creswell, 2014). Also, findings are comprehensive, accurate, and representative of the population because the population is easily accessible (Fink, 2013). Cochran (1977) supported that, studying the entire population as the sample size since it is below 100 can eliminate sampling error by providing a more accurate representation of the population.

Questionnaire instrument was used for collecting data for the study, administered to the respondents of the study face-to-face with the help of 4 research assistants properly trained for that purpose. The instrument was validated by the supervisor and the experts in the field of measurement and evaluation from the Faculty of Environmental Technology, Abubakar Tafawa Balewa University, Bauchi-Nigeria. The reliability of the instrument was measured to be accepted using internal consistency based on the coefficient Cronbach alpha value generated from the SPSS at 0.7 as recommended by Muijs (2004).

Both descriptive statistic (mean, standard deviation, frequency & percentages) and inferential statistic (correlation) were used in analysing the study objectives using SPSS version 23 software as the tool for analysis.

Relative importance index (RII) and rating method.

$$RII = \frac{\sum W}{S \times N}$$

$$0 \leq INDEX \leq 1$$

Where:  $\sum W$  = the summation of the weighting given to each factor; S = maximum score = 5; N = total number of respondents that responded in the sample; while ranking the RII values, the item with the highest RII value is ranked 1<sup>st</sup>, it takes this order till the least item.

$$\text{Mean score (X)} = \frac{5n_5 + 4n_4 + 3n_3 + 2n_2 + 1n_1}{N}$$

Where:  $n_5$  = number of respondents who answered strongly agreed;  $n_4$  = number of respondents who answered agreed;  $n_3$  = number of respondents who answered moderately agreed;  $n_2$  = number of respondents who answered disagreed;  $n_1$  = number of respondents who answered strongly disagreed.

**Table 2: Scale rating for research objectives for decision rule**

Scale	Point	Lower Limit	Upper Limit
Strongly Disagree	1	0.00	1.49
Disagree	2	1.50	2.49
Moderately agree	3	2.50	3.49
Agree	4	3.50	4.49
Strongly Agree	5	4.50	5.00

Source: Adopted from Cyril, Ugwuadu and Bello (2015).

## 4.0 RESULTS AND DISCUSSION

The study administered a total of 100(100%) instruments but retrieved a total of properly filled instruments of 78(87%). According to Mugenda & Mugenda (2003), questionnaire response rate of 50% is sufficient for analysis and reporting, 60% is good and 70% or more is exceptional. However, this study recorded an exceptional response rate with 87%, which found to ideal for reporting and analysis.

### 4.1 Respondents' Demographic Information

Table 6 above revealed the demographic information of the respondents, which the level of education exposed that among the respondents of the study, 20(25.6%) are B.Sc holders; 35(44.9%) are PGD holders; while, 23(29.5%) are M.Sc holders. Age revealed that those within the age range of 30–34years are 2(2.6%); 35–39years are 29(37.2%); while those above 39years are 47(60.3%). From different profession such as 17(21.8%) are Doctors; 7(9%) are Nursing/Midwifery; 17(21.8%) are Pharmacist; 14(17.9%) are Laboratory Scientist; while 23(29.5%) belongs to other profession (like: Radiographer, Dentist, and so on). Concerning their marital status, 7(9%) are single; 57(73.1%) are married; 9(11.5%) are widowed; while, 5(6.4%) are divorced. The respondents' years of experience exposed that, the respondents with 6–10years of experience was 1(1.3%); those with 11–15years of experience are 11(14.1%); 16–20years are 43(55.1%); while, those with above 20years are 3(29.5%). All of the respondents responded that they have heard about sustainability in the health sector.

Table 3: Demographic information of the respondents

SN	Variables	Frequency (F)	Percentage (%)
1	<b>Level of education</b>		
	BS.c	20	25.6
	PGD	35	44.9
	MS.c	23	29.5
	<b>Total</b>	<b>78</b>	<b>100.0</b>
2	<b>Age</b>		
	30 – 34years	2	2.6
	35 – 39years	29	37.2
	> 39years	47	60.3
	<b>Total</b>	<b>78</b>	<b>100.0</b>
3	<b>Profession</b>		
	Doctor	17	21.8
	Nursing/Midwifery	7	9.0
	Pharmacist	17	21.8
	Laboratory Scientist	14	17.9
	Others	23	29.5
	<b>Total</b>	<b>78</b>	<b>100.0</b>
4	<b>Marital status</b>		
	Single	7	9
	Married	57	73.1
	Widowed	9	11.5
	Divorced	5	6.4
	Others	–	–
	<b>Total</b>	<b>78</b>	<b>100.0</b>
5	<b>Years of experience</b>		
	6 – 10years	1	1.3
	11 – 15years	11	14.1
	16 – 20years	43	55.1
	> 20years	23	29.5
	<b>Total</b>	<b>78</b>	<b>100.0</b>
6	<b>Have you heard about sustainability in the health sector?</b>		
	Yes		

No	78	100
<b>Total</b>	<b>78</b>	<b>100.0</b>

## 5.0 Data Analyses

### Result on objective one: To identify macro-area’s criteria that institute sustainability consciousness in healthcare sector in Gombe State

This objective was analysed using relative importance index (RII) and rating method. The mean scores (X) of the variables range between 1.65–4.03 and the standard deviations (SD) range from 1.089–1.557 for environmental macro-area; mean scores (X) of the variables range between 3.60–3.95 and the standard deviations (SD) range from 0.851–1.440 for social macro-area; and mean scores (X) of the variables range between 1.82–3.24 and the standard deviations (SD) range from 0.936–1.452 for economic macro-area. All these standard deviations revealed low values hence the indication of agreement in their assessments.

Table 4 above revealed the macro-area’s criteria for sustainability consciousness in health care sector. Based on environmental macro-area, envelope technologies was deduced to be the most very high index for sustainability consciousness with a mean score (X=4.03) and relative importance index (RII=0.81); waste care was also deduced as another high index for sustainability consciousness with (X=3.60, RII=0.72); water care with (X=3.54, RII=0.71) was rated high index for sustainability consciousness; unconventional source supply with (X=3.41, RII=0.68) was rated high index for sustainability consciousness; another important index for sustainability consciousness was identified to be saving with efficiency with (X=3.31, RII=0.66) considered to be high in rating; materials and resources was identified to be another criteria for creating sustainability consciousness with (X=3.15, RII=0.63); identified again was urban planning with (X=2.86, RII=0.57) with low rating criteria for the sustainability consciousness; and combined heat and power (CHP) with (X=1.65, RII=0.33) was also identified and rated low criteria for sustainability consciousness.

Based on social macro-area, comfort was the most important index for creating sustainability consciousness identified and rated high with (X=3.95, RII=0.79); also identified and rated high was Humanisation with (X=3.64, RII=0.73); and, distribution was identified and rated high with (X=3.60, RII=0.72).

Based on economic macro-area, Managerial performance was identified and rated high as a criterion for sustainability consciousness with (X=3.24, RII=0.64); while, clinical performance also identified but rated low with (X=2.91, RII=0.58); and, technological performance was rated low with (X=1.82, RII=0.36).

However, environmental macro-area was identified and rated high with (X=3.20, RII=0.64); social macro-area was also identified and rated high with (X=3.73, RII=0.75); whereas, economic macro-area was identified and rated low with (X=2.66, RII=0.53).

**Table 4: Macro-area’s criteria for constituting sustainability consciousness**

	X	SD	RII	Decision
<b>Environmental macro-area</b>				
Envelope technologies	4.03	1.173	0.81	Very High
Waste care	3.60	1.188	0.72	High
Water care	3.54	1.089	0.71	High
Unconventional source supply	3.41	1.400	0.68	High
Saving with efficiency	3.31	1.557	0.66	High
Materials and resources	3.15	1.513	0.63	High
Urban planning	2.86	1.457	0.57	Low
Combined heat and power (CHP)	1.65	1.182	0.33	Low
<b>Average Total = 25.5573/8</b>	<b>3.20</b>		<b>0.64</b>	<b>High</b>
<b>Social macro-area</b>				
Comfort	3.95	0.851	0.79	High
Humanisation	3.64	1.206	0.73	High
Distribution	3.60	1.399	0.72	High
<b>Average Total = 11.1923/3</b>	<b>3.73</b>		<b>0.75</b>	<b>High</b>

**Economic Macro-area**

Managerial performance	3.24	1.379	0.64	High
Clinical performance	2.91	1.452	0.58	Low
Technological performance	1.82	0.936	0.36	Low
<b>Average Total = 7.9744/3</b>	<b>2.66</b>		<b>0.53</b>	<b>Low</b>

N=78.

**Results on objective two: To evaluate the path to sustainability consciousness for healthcare service demand and supply in Gombe State**

This objective was analysed using mean score, standard deviation, as well as ranking method with a decision reached as shown in table 5 below. The mean scores (X) of the variables range between 3.77–4.00, these shows that the respondents were in concord with all the variables in question; while the standard deviations (SD) range from 0.844–1.172 for path to sustainability consciousness in healthcare service; the low values of standard deviations posed the indication of agreement in the assessments of the respondents.

Table 5 below exposed the path to sustainability consciousness for healthcare services. Foster skill and will to create value-conscious consumers was determined and agreed to be one of the most considered paths to sustainability consciousness for healthcare services with (X=4.00, SD= 1.151) which was ranked 1<sup>st</sup>; promoting technology innovations that lower cost and leverage talent to raise quality was determined and agreed as another path to sustainability consciousness for healthcare services with a (X=4.00, SD=1.069) which was ranked 2<sup>nd</sup>; implementing modern management and focus on performance was agreed and determined to be path to sustainability consciousness for healthcare services which was ranked 3<sup>rd</sup> with (SD=0.983, X=3.91); paying for value, not for volume was also agreed and determined to be another path to sustainability consciousness for healthcare services, was ranked 4<sup>th</sup> with (X=3.83, SD=0.844); proactively reach out to predict and prevent ill health and manage disease was ranked 5<sup>th</sup> with (X=3.82, SD=0.936) was agreed and determined to be path to sustainability consciousness; measure value and invest for the greatest returns was agreed and determined with (X=3.80, SD=0.873) to be another path to sustainability consciousness was ranked 6<sup>th</sup>; and, reinventing the delivery system with new models of care was agreed and determined as another path to sustainability consciousness with (X=3.77, SD=1.172) which was ranked 7<sup>th</sup>.

**Table 5: Path to sustainability consciousness for healthcare services**

	X	SD	Rking	Decision
Foster skill and will to create value-conscious consumers	4.03	1.151	1	Agreed
Promote technology innovations that lower cost and leverage talent to raise quality	4.00	1.069	2	Agreed
Implement modern management and focus on performance	3.91	.983	3	Agreed
Pay for value, not for volume	3.83	.844	4	Agreed
Proactively reach out to predict and prevent ill health and manage disease	3.82	.936	5	Agreed
Measure value and invest for the greatest returns	3.80	.873	6	Agreed
Reinvent the delivery system with new models of care	3.77	1.172	7	Agreed

N = 78. Rking = Ranking.

**Results on objective three: To evaluate the relationship of macro-area’s criteria and the path to sustainability consciousness for healthcare demand and supply in healthcare sector in Gombe State**

This objective was determined using Spearman’s correlation (rho) for the purpose of deducing the relationship and the significance of the variables. The interpretation of the values of coefficient of correlation is:  $\rho = 0.10-0.29 =$  small;  $\rho = 0.30-0.49 =$  medium; and  $\rho = 0.50-1.0 =$  large (Cohen, 1988).

Table 6 below exposed the relationship of the macro-area’s criteria that institute sustainability consciousness and the paths to sustainability consciousness in healthcare sector using spearman’s rho; the relationship revealed r - value of 0.631\*\* and p-value < 0.05, which means that, there is large positive and significant relationship between the macro-area’s criteria that institute sustainability consciousness and the paths to sustainability consciousness in healthcare sector (N=78, r=0.631, p=0.005<0.05).

**Table 6: Spearman’s rho of macro-area’s criteria for SC and paths to sustainability consciousness**

	MAC	PSC
Spearman’s rho Macro-area’s criteria (MAC) Correlation Coefficient	1.000	.631**

	Sig. (2-tailed)	.	.005
	N	78	78
Path to sustainability consciousness (PSC)	Correlation Coefficient	.631**	1.000
	Sig. (2-tailed)	.005	.
	N	78	78

\*\* . Correlation is significant at the 0.01 level (2 tailed).

SPSS output: Spearman’s correlation.

## 6.0 Discussion

### Objective One: Macro-area’s criteria that institute sustainability consciousness in healthcare sector in Gombe State

Table 4 revealed environmental macro-area (X=3.20, RII=0.64), and social macro-area (X=3.73, RII=0.75) were the high important macro-area’s criteria for sustainability consciousness in health care sector, as economic macro-area (X=2.66, RII=0.53) was rated low important macro-area’s criteria for sustainability consciousness in health care sector. Even in related to environmental macro-area, envelope technologies (X=4.03, RII=0.81) was the most very high index for sustainability consciousness; for social macro-area, comfort (X=3.95, RII=0.79) was the highest important index for creating sustainability consciousness; but for economic macro-area, managerial performance (X=3.24, RII=0.64) was rated high criterion for sustainability consciousness.

The finding of this object agreed with results of Buffoli *et al.* (2013), Capolongo *et al.* (2011), Origgi *et al.* (2011), Baglioni and Capolongo (2002). This objective finding also validates the claim of Smith (2012) that, concept of sustainability for business now includes both environmental and social aspects as the health care has performance, environmental, operational and management standards like any industry. It clarifies some earlier assertion by Szekely and Knirsch (2005) that, the internal and external factors favoring the adoption of a sustainable approach in healthcare industry. For the stakeholders to be sustainability conscious, an increased level of humanization inside the hospital, both for users and staff is encouraged, since an effective treatment in most of the cases cannot prescind from comfortable spaces and positive work environment. Higher attention to available resources should be placed as the hospital is a high-energy-demanding structure and consumes significant amounts of resources, which are finite and limited in time. Widely spread multidisciplinary should be the consideration because, sustainability is a holistic concept, made up by several elements, tightly entangled; so, the achievement of an objective cannot be reached leaving aside the understanding of each single issue, but the whole complex matter has to be analyzed (Buffoli *et al.*, 2013).

### Objective Two: Path to sustainability consciousness for healthcare service demand and supply in Gombe State

Table 5 revealed the three most path to sustainability consciousness for healthcare services to include foster skill to create value-conscious consumers (X=4.03), promoting technology innovations that lower cost and leverage talent to raise quality (X=4.00), and implementing modern management and focus on performance (X=3.91).

This finding of this objective agrees with the outcome of WHO (2017), Andersson (2011), as patients and populations should be empowered with the right information at the right time, their incentives to make doing the right thing as well as focusing on technology for both cost-efficiency and enhancement, and to use the digital revolution to maximize the productivity of healthcare workers by redesigning lean processes and management practices to manage service-line performance. This to ensure that incentives of payers and providers is realign to pay for the holistic care of whole populations or patient pathways in order to manage disease to reduce lifetime costs by delivering high-quality care in capital-light settings and low-cost channels, and influence patients to do more for their care.

### Objective Three: Relationship of macro-area’s criteria and the path to sustainability consciousness for healthcare demand and supply in healthcare sector in Gombe State

Table 6 revealed the evidence of large positive significant relationship between the macro-area’s criteria that institute sustainability consciousness and the paths to sustainability consciousness in healthcare sector (N=78, r=0.631, p=0.005<0.05).

## 7.0 CONCLUSION AND RECOMMENDATIONS

### 7.1 Conclusions

The research concluded based on the study objectives as follows:

- i. Environmental macro-area criteria with envelope technologies and social macro-area criteria with comfort are the highest important macro-area's criteria that institute sustainability consciousness in healthcare sector in Gombe State.
- ii. Foster skill to create value-conscious consumers, promoting technology innovations that lower cost and leverage talent to raise quality, and implementing modern management and focus on performance are the three most path to sustainability consciousness for healthcare demand and supply in Gombe State.
- iii. There was large positive significant relationship between the macro-area's criteria that institute sustainability consciousness and the paths to sustainability consciousness for healthcare demand and supply in healthcare sector in Gombe State (N=78, r=0.631, p<0.05).

### 7.2 Recommendations

The research recommended based on the conclusions of the study as follows:

- i. Stakeholders and medical professionals need to create a serious awareness to the entire public for the paramount importance to shift utmost attention to integrate sustainability consciousness in their dealings in healthcare sector, and more needs to be invest in healthcare sector so to increase clinical and technological performances in the sector.
- ii. More statutory laws should be worked and put in place both locally, nationally, and globally to ensure more paths to sustainability consciousness for healthcare service demand and supply to achieve high quality of healthcare for all.
- iii. Government and relevant stakeholders should buckle up and embark on a holistic approach with no sentiment that will encourage sanity in the healthcare sector and guarantee safety for all habitat which can ensure sustainability consciousness in healthcare.

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