

# DENIZEN NUTRITIONAL THERAPY FOR ELDERLY COPD PATIENTS PREDISPOSED TO COVID-19 IN PORT HARCOURT, RIVERS STATE

**Asouzu, Ann Ifeoma (Ph D.)**

Department of Home Economics and Hotel Management,  
Ignatius Ajuru University of Education  
Port Harcourt, Rivers State Nigeria

**Correspondence Email: [smaliemum@yahoo.com](mailto:smaliemum@yahoo.com)**

## **Abstract**

The study examined the denizen nutritional therapy for elderly COPD patients predisposed to COVID-19 in Port Harcourt, Rivers State Nigeria. The study adopted the descriptive research design. A sample of 150 respondents (comprising 91 nutritionists/food scientist, 26 dieticians, and 33 Home Economists) was selected from IAUE, RSU, UNIPORT, RSUTH, and UPTH in the study area. A 28-item 2 experts (i.e. 1 nutritionist and 1 dietician) validated 4-point scale instrument titled “Nutritional Therapy for Elderly COPD Patients Predisposed to COVID-19 Scale” (NUTECPPCS) with a reliability coefficient of 0.802 was used to elicit data analyzed using mean and standard deviation (with a criterion mean cutoff of 2.5). The study revealed grand mean scores of: 3.03, 3.06, 3.10, and 3.12 respectively indicated the extent local: vitamin rich-diets (like tomatoes, turmeric, curry leaf, sour sop, coconut, and ginger), potassium rich-diets (like ugu, ginger, tomatoes, lemon, spinach, lecttus, thyme, and garlic), minerals rich-diets (like ginger, garlic, turmeric, salt, tiger nut, and coconut), and protein rich-diets (like ewi, ugba, ukwa, soyabean, akidi, ogazi, egg, and obojo fish) contain fibre that aids weight control, and blood circulation in the lungs. Alongside, aid in boosting immunity for reducing airway inflammation, and improved breathing of elderly COPD patients with COVID-19. The study recommended that: nutritionists and dieticians embark on a detailed compilation of local diets rich in the required level of vitamins, minerals, potassium and protein that would benefit elderly COPD patients infected with a respiratory infection like COVID-19. Alongside, elderly COPD patients desisting from the intake of high salt with its attendant water retention that erupts breathing difficulties and the severity of COVID-19 complications.

**Keywords:** Denizen nutritional therapy, elderly, COPD, COVID-19, Rivers State, Nigeria.

## **Introduction**

COPD (otherwise Chronic Obstructive Pulmonary Disease) is a disease (like asthma, emphysema, and chronic bronchitis) that blocks the air flow and causing breathing difficulties. Several COPD patients may have a severe risk of COVID-19 complications, which could affect the respiratory system and likely accentuating an irreversible damage of the lungs to fight off any infection. Similarly, COVID-19 is a global pandemic with common symptoms notably; fever,

breathlessness, cough, body aches and pains, runny or congested nose, sore throat, headache, chills, repeated shaking with chills, and new loss of taste or smell (Sissons & Biggers, 2020). Also, COPD patients who contact COVID-19 experience respiratory infection and are thereafter isolated for critical medical care due to the case fatality rate (CFR) of 6.3% (Cohen, 2014).

Holick's (2007) epidemiological study revealed that a lung or respiratory disease (like COPD) can be controlled or handled from nutrients obtained from dietary patterns on antioxidants (such as vitamins C and E, and flavonoids). Equally, antioxidants are associated with positive effects on respiratory disease prevention using native foods such as fruits and vegetables and fish that contain other micronutrients, fibre and compounds with both recognized anti and pro-inflammatory potential (Varraso, 2012). Equally, increasing intake of local fruits and vegetables is proportional to increasing intake of the integral multiple nutrients (like vitamins C, D and E, potassium, minerals, unsaturated fat, proteins, carotenoids and flavonoids), which is beneficial and significant in managing or reducing the risk of respiratory diseases like COPD and infections like COVID-19 (Shaheen, Jameson, Syddall, Aihie-Sayer, Dennison, Cooper & Robinson, 2010), and incidence of asthma exacerbations (Wood, Garg, Smart, Scott, Barker & Gibson, 2012).

Furthermore, denizen nutrition therapy (conceptualized as the use of specific native or local foods or diets to aid the recuperation, recovery or treatment of persons with certain illness, disease or infection) can efficaciously give or offer the requisite nutrients for managing or controlling respiratory diseases. Thus, regular intake of local fat (like groundnut and cashew nut), and protein rich foods (like ewi, ogazi, egg, and akidi). Including fresh fruits (like coconut, avocado, sour sop, African pea, apricot and citrus like orange, etc.) and dark green non-starchy vegetables (like carrot, tomatoes, cabbage, ugu, spinach, lectus, cucumber, garlic, ginger, turmeric, and tiger nut). Contains essential vitamins, minerals, proteins, potassium and fibre, which Janchote and Butler (2020) term as healthy nutrition vital for boosting immunity for active lung function, and reducing water retention that weakens the respiratory system of COPD patients symptomatic/asymptomatic to COVID-19. In addition, local fibre rich micronutrients like jackbean risotto, cowpea, and Nestro contain vitamins and minerals that builds body tissues and control blood functions (Asouzu, 2014).

Although, pharmacological management has been hyped as the prime treatment of respiratory diseases, as healthy diets are said to rarely cures but only help boost the immune system for fighting infection (Berthon & Wood, 2015). However, exploring the relevance of dietary options for treating and preventing diseases underscored Asouzu (2017) report that cognizance on therapeutic foods increases access to the right local and organic dietary supplement to revive or resuscitate respiratory system, maintain lung health and boost immunity against nutritional-induced conditions like COPD. Thus, dietary intake of vitamin D (Foong & Zosky, 2013), vitamins C and E (Wassall, Devereux, Seaton & Barker, 2013), and minerals (Andersson, Grönberg, Slinde, Bosaeus & Larsson, 2007), derived from local fruits and vegetables intake (Seyedrezazadeh, Moghaddam, Ansarin, Vafa, Sharma & Kolahdooz, 2014), that protects against the susceptibility

to and severity of respiratory infections, asthma and COPD especially for the isolated or integrated elderly (i.e. older persons 65 years and above) predisposed (i.e. increased risk) to COVID-19.

Nutrition or dietary supplement plays vital role in the treatment procedure for mild, acute and chronic diseases or ailments, this relates to the current globally ravaging COVID-19 pandemic that is associated with adverse symptoms and outcomes in elderly patients with pulmonary or respiratory disease (Zhou, Yu, Du, Fan, Liu & Liu, 2020). In view of this, nutritional supplement stems to help prevent high body mass index (BMI) and deficient dieting due to poor prognosis or prediction in comorbid patients of older age with COVID-19 (Laviano, Koverech & Zanetti, 2020). This manifests conditions that practically impairs the nutritional status that erupts issues likely influencing the outcome of COVID-19 on such elderly persons having any of the COPDs (Peng, Meng, Guan, Leng, Zhu & Wang, 2020). Hence, the timeliness of nutritional intervention is critical for boosting immunity against airway inflammation, toxins, and other complications likely in older COVID-19 patients with underlying COPD, as their symptoms progress from cough to dyspnea, and then to respiratory failure (Arentz, Yim, Klaff, Lokhandwala, Riedo & Chong, 2020).

### **Statement of the Problem**

Certain nutrients and dietary patterns are strongly associated with treating particular ailments. Thus, specific dietary patterns through high intake of local fruits (like oranges, coconut, sour sop, avocado and apricot) and dark green non-starchy vegetables (such as carrot, cabbage, ugu, spinach, lecttus, and cucumber) contains vitamins (like C, D and E), potassium, minerals, and unsaturated fat which builds immunity or insusceptibility against the severity or worsening of the breathing problems predisposing elderly persons with COPD who are at-risk of COVID-19 with its related respiratory system complications. This portrays nutrition as beneficial and significant comorbid (i.e. medicine of a disease or symptoms like COPD and COVID-19 that occurs at same time) used for managing or reducing the likely risks in protracted and obtrusive breathing diseases.

Although, nutrition or dietary intake suffices as effective boost to immunity for fighting respiratory diseases like COVID-19 and loss of lung functioning and ageing as in COPD (Rana, 2018). However, Asouzu (2014) states that the awareness and compliance on the guideline for preparing and blending ingredients towards producing a certain food, diet, dish or drink (otherwise recipe) is most the important determinant for realizing therapeutic food and nutritional education. If not, under and over-nutrition in diets may lead to the getting insufficient or excess vitamins, potassium, minerals, fat and protein required as nutritional therapy for elderly COPD patients predisposed with COVID-19. This exacerbate risk conditions thereby erupting symptoms and complications (like respiratory problems, airway inflammation, low immunity system, etc.) that may adversely affect the health of COPD patients (like elderly persons) infected with COVID-19.

Critics have painted a gloomy future that the absence of early and comprehensive guideline (whether pharmacological and nutritional) for managing and treating critically ill persons, appears to present the real challenges for the successful rehabilitation of elderly COVID-19 patients with underlying COPD (Barazzoni, Bischoff, Krznaric, Pirlich & Singer, 2020). However, the initiative

and previous studies by international nutrition scientific societies into “Controlled Dietary Pattern” is geared towards projecting and expanding the efficacy and use of indigenous nutrition as therapy for healing of respiratory conditions alongside the reduction of the attendant case fatality rates for older or elderly COPD patients infected with COVID-19 (Cohen, 2014; Bah, Lamah, Fletcher, Jacob, Brett-Major & Sall, 2015). Based on this premise, this study investigates denizen nutritional therapy for elderly COPD patients predisposed to COVID-19 in Port Harcourt, Rivers State.

Specifically, the purposes of this study were to determine:

- i. the extent intake of native diets with the required vitamins aids in the treatment of elderly COPD patients infected with COVID-19 in Port Harcourt, Rivers State.
- ii. the extent intake of native diets with the required potassium aids in the treatment of elderly COPD patients infected with COVID-19 in Port Harcourt, Rivers State.
- iii. the extent intake of native diets with the required minerals aids in the treatment of elderly COPD patients infected with COVID-19 in Port Harcourt, Rivers State.
- iv. the extent intake of native diets with the required protein aids in the treatment of elderly COPD patients infected with COVID-19 in Port Harcourt, Rivers State.

The following research questions guided this study:

1. To what extent does intake of native diets with the required vitamins aids in the treatment of elderly COPD patients infected with COVID-19 in Port Harcourt, Rivers State?
2. To what extent does intake of native diets with the required potassium aids in the treatment of elderly COPD patients infected with COVID-19 in Port Harcourt, Rivers State?
3. To what extent does intake of native diets with the required minerals aids in the treatment of elderly COPD patients infected with COVID-19 in Port Harcourt, Rivers State?
4. To what extent does intake of native diets with the required protein aids in the treatment of elderly COPD patients infected with COVID-19 in Port Harcourt, Rivers State?

### **Scope of the Study**

This study centred on the denizen nutritional therapy for elderly COPD patients predisposed to COVID-19. In terms of geographic scope, the study would be conducted in Port Harcourt, Rivers State, Nigeria. While in the terms of content scope, the study would be centred on the nutritionists/food scientists, dieticians, and Home Economists constantly prescribing recipes for persons with respiratory infections like COVID-19 with underlying COPD. Furthermore, the independent variable is native diets, while the dependent variables are COPD and COVID-19.

### **Methodology**

**Research Design:** This study adopted the descriptive survey research design. The descriptive survey research design is utilized when the researcher intends to systematically sample a subset from a large population (like nutritionists/food scientists, dieticians, and Home Economists) with

similar characteristics and features, and thereafter describes the characteristics and features of that sample as they are at the particular time of the study (Nwankwo, 2013).

**Study Area:** This study was carried out in Port Harcourt Local Government Area Rivers State, Nigeria. The study area is traditionally occupied by the majority Ikwerre ethnic group, and the minority Ijaw speaking people at the fringes. Port Harcourt Local Government Area has a population of 541,115 (NPC, 2006) with a projected population growth rate of 3.43% giving rise to a population of 768, 157 (NPC, 2016). Also the study area is bounded by Obio-Akpor, Okrika Local Government Areas, and Atlantic Ocean. Furthermore, Port Harcourt has traditional occupations like farming (in crops like cassava, vegetables, yam, cucumber, okra, maize, cocoyam, etc.), lumbering (due to the presence of vast or massive prehistoric forests), and fishing activities due to the presence of streams and rivers traversing the area.

However, the highly urbanizing, industrializing and metropolitan status of Port Harcourt Local Government Area (LGA) has led to the transition from these traditional occupations to modern occupations like civil service, public service, business, teaching, crude oil exploration, service, and manufacturing. These transiting or emerging occupations alongside the associated or attendant large influx of people (i.e. population) from different local and foreign ethnic nationalities accounts for the presence of private and public establishments (like courts, ministries, parastatals, etc.), security outfits (Police, Civil Defense, Army, Navy, Air Force, Customs, Immigration, and Prisons), banks, indigenous and multinational oil companies (like Shell, Chevron, NNPC, Mobil, Aveon, etc.), markets, telecommunication companies (like MTN, Airtel, Globacom, and 9 Mobile), private and public health institutions (like Primary Health Care Centers, Secondary and Tertiary Health facility (like Rivers State University Teaching Hospital), private and public educational institutions (via primary, secondary and tertiary), and other social, commercial enterprises (like Spar, Market Square, Chanrais, Everyday Emporium, etc.), administrative facilities, and service establishments or centres especially banks; notably: UBA, GT Bank, First Bank, Fidelity, Access Bank, Eco Bank, Zenith, Polaris, Union Bank, among others.

**Population for the Study:** The population for the study comprised of all the aggregated 120 (i.e. male and female) Nutritionists/Food Scientists (via 52 in Ignatius Ajuru University of Education; 38 in Rivers State University, and 30 in University of Port Harcourt) and 35 (both male and female) dieticians (5 in Rivers State University, 18 in the University of Port Harcourt Teaching Hospital, 12 in Rivers State University Teaching Hospital, Port Harcourt), and 44 Home Economists (i.e. 17 in Ignatius Ajuru University of Education; 14 in Rivers State University, and 13 in University of Port Harcourt).

**Sample and Sampling Technique:** A sample of 150 respondents (via 91 nutritionists/food scientist, 26 dieticians, and 33 Home Economists) participated in the study. The study adopted a four phase multistage sampling technique. Firstly, 75% of the population of the nutritionists, dieticians, and Home Economists was considered as the sample in the study. In the second phase, 91 nutritionists were selected using proportionate sampling technique and then random sampling

technique to determine and select respectively the sample of 39 nutritionists (i.e. 8 lecturers, 21 Master students and 10 PhD candidates) in Ignatius Ajuru University of Education (IAUE), 29 nutritionists (i.e. 6 lecturers, 18 Master students and 5 PhD candidates) in Rivers State University of Science and Technology (RSUST), and 23 nutritionists (i.e. 8 lecturers and 15 Master students) in University of Port Harcourt (UNIPORT).

Thirdly, proportionate stratified random sampling technique was used in the selection of 26 Dieticians (via: 3 in Rivers State University (RSU), 14 in the University of Port Harcourt Teaching Hospital (UPTH), and 9 in Rivers State University Teaching Hospital (RSUTH). While in the fourth and final phase, proportionate sampling technique and then random sampling technique was used in the determination and selection of 33 Home Economists (via: 13 in Ignatius Ajuru University of Education; 10 in Rivers State University, and 10 in University of Port Harcourt). This constituted a sample of 150 respondents (via 91 nutritionists, 26 dieticians, and 33 Home Economists) that was used for the study.

**Instrumentation:** The instrument for data collection was 28 item self-structured instrument titled “Nutritional Therapy for Elderly COPD Patients Predisposed to COVID-19 Scale” (NUTECPPCS). The NUTECPPCS instrument was patterned after a four point rating scale of “Very High Extent” (VHE, 4 Points), “High extent” (HE, 3 Points), “Low Extent” (LE, 2 Points), and “Very Low Extent” (VLE, 1 Point). Furthermore, the NUTECPPCS instrument consist of two sections. Section A elicited the demographics of the respondents while Section B comprised 7 items each on extent intake of vitamins, potassium, minerals, and proteins on treatment of elderly COPD patients predisposed with COVID-19.

**Validation of Instrument:** The face and content validity of the NUTECPPCS instrument was determined by two (2) experts (i.e. 1 Nutritionist in Rivers State University, and 1 Dietician in University of Port Harcourt Teaching Hospital (i.e. UPTH)). These validates were presented with the topic, objectives and research questions of this study for their comments, suggestions, and views which were integrated or incorporated in order to improve the validity of the NUTECPPCS instrument.

**Reliability of the Instrument:** The reliability or internal consistency of the NUTECPPCS instrument was ascertained using Cronbach Alpha ( $\alpha$ ) method. In doing this 40 copies of the NUTECPPCS instrument was administered to a random sample of (20 Nutritionists, and 12 Home Economists, and 8 Dieticians) from the Department of Hospitality and Tourism in Imo State University Owerri, and Federal Medical Centre, Owerri respectively (which was not used for the study). Then 40 copies of the NUTECPPCS instrument were distributed to these respondents (i.e. nutritionists, dieticians, and Home Economists) and upon completion, the NUTECPPCS instrument was retrieved, coded and analyzed using the Cronbach Alpha ( $\alpha$ ) method to obtain a

reliability coefficient of 0.802. This reliability coefficient obtained necessitated the use of the NUTECPPCS instrument for administration.

**Method of Data Collection:** The face-to-face direct delivery technique was adopted by the researcher and the engaged research assistants as the method of data collection to all the 150 respondents. The NUTECPPCS instrument was administered to each of 150 respondents (i.e. nutritionists, dieticians, and Home Economists) selected in this study. Out of the 150 copies of the NUTECPPCS instrument administered to the respondents, only 137 copies (representing approximately 91% return rate) were validly retrieved and used for the analysis.

**Method of Data Analysis:** The collected data was scored, tabulated, coded, and analyzed using mean and standard deviation with a criterion mean cutoff of 2.5 to answer the research questions.

## RESULTS

**Research Question 1:** To what extent does intake of native diets with the required vitamins aids in the treatment of elderly COPD patients infected with COVID-19 in Port Harcourt, Rivers State?

**Table 1: Mean and Standard Deviation on the extent intake of native diets with the required vitamins aids in the treatment of elderly COPD patients infected with COVID-19 in Port Harcourt, Rivers State**

S/N	Extent intake of native diets with required vitamins for the treatment of elderly COPD patients with COVID-19 include:	N = 137		Decision
		Mean	SD	
1	Turmeric contains curcumin which aids in reducing inflammation in the lungs	3.21	.83	#
2	Tomatoes gives vitamins C that helps keep the lungs strong	3.03	.80	#
3	Avocado and oranges contains vitamins that improves constant flow of oxygen for patients with a chronic lung disease	2.93	.75	#
4	Sour sop and coconut contain fibre that help control weight gain which can induce the severity of COVID-19	3.03	.59	#
5	Tomatoes contain lycopene that helps to keep respiratory ailments at bay	3.28	.98	#
6	Foods spiced with curry leaf is a great source of vitamins C which improves the respiratory system	3.04	1.05	#
7	Ginger contains vitamins C and E that reduces the risk of respiratory infections like COVID-19	2.68	.90	#
<b>Grand Mean</b>		<b>3.03</b>	<b>0.84</b>	<b>#</b>

# (Agree) =  $\geq 2.50$  while \* (Disagree) =  $< 2.50$ .

Table 1 shows that the mean rating and standard deviation on the extent intake of native diets with the required vitamins aids in the treatment of elderly COPD patients infected with COVID-19 in Port Harcourt, Rivers State includes: tomatoes contain lycopene that helps to keep respiratory ailments at bay ( $\bar{X}$  = 3.28) in item 5, turmeric contains curcumin which aids in reducing inflammation in the lungs ( $\bar{X}$  = 3.21) in item 1, foods spiced with curry leaf is a great source of

vitamins C which improves the respiratory system ( $\bar{X} = 3.04$ ) in item 6, tomatoes gives vitamins C that helps keep the lungs strong in item 2, and sour sop and coconut contain fibre that help control weight gain which can induce the severity of COVID-19 in item 4 (each with  $\bar{X} = 3.03$ ), avocado and oranges contains vitamins that improves constant flow of oxygen for patients with a chronic lung disease ( $\bar{X} = 2.93$ ) in item 3, while the least was ginger contains vitamins C and E that reduces the risk of respiratory infections like COVID-19 ( $\bar{X} = 2.68$ ) in item 7. Furthermore the grand mean score of 3.03 indicates the extent that the intake of native diets with the required vitamins aids in the treatment of elderly COPD patients infected with COVID-19 in Port Harcourt, Rivers State.

**Research Question 2:** To what extent does intake of native diets with the required potassium aids in the treatment of elderly COPD patients infected with COVID-19 in Port Harcourt, Rivers State?

**Table 2: Mean and Standard Deviation on the extent intake of native diets with the required potassium aids in the treatment of elderly COPD patients infected with COVID-19 in Port Harcourt, Rivers State**

S/N	Extent intake of native diets with required potassium for the treatment of elderly COPD patients with COVID-19 include:	N = 137		Decision
		Mean	SD	
8	Ginger and tomato helps fight throat infection that increases the severity of COVID-19	3.19	.85	#
9	Spinach and lecttus helps to eliminate toxins in the body	3.11	.94	#
10	Regular intake of tomatoes and lemon helps in lung function that eases the effect of COVID-19 on elderly COPD patients	3.12	.85	#
11	Ugu intake help improve blood circulation in the lungs of COPD patients	3.28	.74	#
12	Ginger and garlic helps to break down mucus that makes it easy for the body to expel air	2.83	.89	#
13	Tomatoes contain lycopene which helps reduce airway inflammation that adversely affects COVID-19 patients	2.99	.82	#
14	Thyme helps clear out mucus and improves breathing rate	2.90	.86	#
<b>Grand Mean</b>		<b>3.06</b>	<b>0.85</b>	<b>#</b>

# (*Agree*) =  $\geq 2.50$  while \* (*Disagree*) =  $< 2.50$ .

Table 2 shows that the mean rating and standard deviation on the extent intake of native diets with the required potassium aids in the treatment of elderly COPD patients infected with COVID-19 in Port Harcourt, Rivers State includes: ugu intake help improve blood circulation in the lungs of COPD patients ( $\bar{X} = 3.28$ ) in item 11, ginger and tomato helps fight throat infection that increases the severity of COVID-19 ( $\bar{X} = 3.19$ ) in item 8, regular intake of tomatoes and lemon helps in lung function that eases the effect of COVID-19 on elderly COPD patients ( $\bar{X} = 3.12$ ) in item 10,



spinach and lecttus helps to eliminate toxins in the body ( $\bar{X} = 3.11$ ) in item 9, tomatoes contain lycopene which helps reduce airway inflammation that adversely affects COVID-19 patients ( $\bar{X} = 2.99$ ) in item 13, thyme helps clear out mucus and improves breathing rate ( $\bar{X} = 2.90$ ) in item 14, while the least was ginger and garlic helps to break down mucus that makes it easy for the body to expel air ( $\bar{X} = 2.83$ ) in item 12. Furthermore the grand mean score of 3.06 indicates the extent that the intake of native diets with the required potassium aids in the treatment of elderly COPD patients infected with COVID-19 in Port Harcourt, Rivers State.

**Research Question 3:** To what extent does intake of diets with the required minerals aids in the treatment of elderly COPD patients infected with COVID-19 in Port Harcourt, Rivers State?

**Table 3: Mean and Standard Deviation on the extent intake of native diets with the required protein diets in the treatment of elderly COPD patients infected with COVID-19 in Port Harcourt, Rivers State**

S/N	Extent intake of native diets with the required minerals for the treatment of elderly COPD patients with COVID-19 include:	N = 137		Decision
		Mean	SD	
15	Tiger nut and coconut contain fibre that help improve COVID-19 patients ability to breathe and retain energy for physical activity	2.93	.94	#
16	High sodium or salty diets increases water retention which may affect the ability of COVID-19 patients to breathe	3.05	.63	#
17	Garlic help remove toxins that damage the inner linings of the blood vessels that causes low oxygen in COVID-19 patients	3.04	.77	#
18	Garlic acts as antibiotics that help break up congestion that can affect the lungs and breathing of COVID-19 patients	3.17	.88	#
19	Ginger and garlic reliefs COVID-19 patients from the dangers of airway and lung inflammation or swelling	3.25	.84	#
20	Ginger contain minerals that help to keep the lungs strong and improve the breathing of people with COPD	3.17	.95	#
21	Turmeric contains curcumin which provides the oomph against breathing problems for COVID-19 patients	3.07	.96	#
<b>Grand Mean</b>		<b>3.10</b>	<b>0.85</b>	<b>#</b>

# (Agree) =  $\geq 2.50$  while \* (Disagree) =  $< 2.50$ .

Table 3 shows that the mean rating and standard deviation on the extent intake of native diets with the required minerals aids in the treatment of elderly COPD patients infected with COVID-19 in Port Harcourt, Rivers State includes: ginger and garlic reliefs COVID-19 patients from the dangers of airway and lung inflammation or swelling ( $\bar{X} = 3.25$ ) in item 19, garlic acts as antibiotics that help break up congestion that can affect the lungs and breathing of COVID-19 patients in item 18, and ginger contain minerals that help to keep the lungs strong and improve the breathing of people

with COPD in item 20 (each with  $\bar{x} = 3.17$ ), turmeric contains curcumin which provides the oomph against breathing problems for COVID-19 patients ( $\bar{x} = 3.07$ ) in item 21, high sodium or salty diets increases water retention which may affect the ability of COVID-19 patients to breathe ( $\bar{x} = 3.05$ ) in item 16, garlic help remove toxins that damage the inner linings of the blood vessels that causes low oxygen in COVID-19 patients ( $\bar{x} = 3.04$ ) in item 17, while the least was tiger nut and coconut contain fibre that help improve COVID-19 patients ability to breathe and retain energy for physical activity ( $\bar{x} = 2.93$ ) in item 15. Furthermore the grand mean score of 3.10 indicates the extent that the intake of native diets with the required minerals aids in the treatment of elderly COPD patients infected with COVID-19 in Port Harcourt, Rivers State.

**Research Question 4:** To what extent does intake of native diets with the required protein aids in the treatment of elderly COPD patients infected with COVID-19 in Port Harcourt, Rivers State?

**Table 4: Mean and Standard Deviation on the extent intake of native diets with the required protein aids in the treatment of elderly COPD patients infected with COVID-19 in Port Harcourt, Rivers State**

S/N	The extent intake of native diets with the required protein aids in the treatment of elderly COPD patients with COVID-19 include:	N = 137		Decision
		Mean	SD	
22	Ogazi or guinea fowl and egg increases immunity against the severity of respiratory diseases or infections like COVID-19	3.00	.79	#
23	Regular intake of akidi can help reduce breathing problems in people with COPD	3.11	.80	#
24	Ewi or rabbit contains proteins that improves constant flow of oxygen which helps patients with chronic lung diseases	3.26	.73	#
25	Obojo fish contains high protein that help breakdown mucus that relieve coughs that can worsen COVID-19	2.89	.78	#
26	Turmeric contain curcumin that can prevent the activation of inflammation-causing proteins	3.09	.80	#
27	Soyabean helps control weight that cause breathing problem for persons with respiratory infection like COVID-19	3.21	.87	#
28	Ugba and ukwa contains proteins that help get rid of mucus that can reduce the breathing of patients with COVID-19	3.26	.99	#
<b>Grand Mean</b>		<b>3.12</b>	<b>0.82</b>	<b>#</b>

# (Agree) =  $\geq 2.50$  while \* (Disagree) =  $< 2.50$ .

Table 4 shows that the mean rating and standard deviation on the extent intake of diets with the required protein aids in the treatment of elderly COPD patients infected with COVID-19 in Port Harcourt, Rivers State includes: ewi or rabbit contains proteins that improves constant flow of oxygen which helps patients with chronic lung diseases in item 24, and ugba and ukwa contains proteins that help get rid of mucus that can reduce the breathing of patients with COVID-19 (each

with  $\bar{X} = 3.26$ ), soyabean helps control weight that cause breathing problem for persons with respiratory infection like COVID-19 ( $\bar{X} = 3.21$ ) in item 27, regular intake of akidi can help reduce breathing problems in people with COPD ( $\bar{X} = 3.11$ ) in item 23, turmeric contain curcumin that can prevent the activation of inflammation-causing proteins ( $\bar{X} = 3.09$ ) in item 26, ogazi or guinea fowl and egg contains proteins that increases immunity against the severity of respiratory diseases or infections like COVID-19 ( $\bar{X} = 3.00$ ) in item 22, while the least was obojo fish contains high protein that help breakdown mucus that relieve coughs that can worsen COVID-19 ( $\bar{X} = 2.89$ ) in item 25. Furthermore the grand mean score of 3.12 indicates the extent that the intake of diets with the required protein aids in the treatment of elderly COPD patients infected with COVID-19 in Port Harcourt, Rivers State.

### Discussion of Findings

The result in Table 1 revealed a grand mean score of 3.03 which indicated that the extent intake of diets with the required vitamins aids in the treatment of elderly COPD patients infected with COVID-19 in Port Harcourt, Rivers State includes: tomatoes contain lycopene that helps to keep respiratory ailments at bay, turmeric contains curcumin which aids in reducing inflammation in the lungs, foods spiced with curry leaf is a rich source of vitamins C which improves the respiratory system, tomatoes gives vitamins C that helps keep the lungs strong, sour sop and coconut contain fibre that help control weight gain which can induce the severity of COVID-19, avocado and oranges contains vitamins that improves constant flow of oxygen for patients with a chronic lung disease, and ginger contains vitamins C and E that reduces the risk of respiratory infections like COVID-19. This finding is consistent with Russell (2019) that dietary choices in available fruits (like coconut, oranges, pawpaw, sour sop, and avocado) and non-starchy vegetables (like carrot, cabbage, ugu, spinach and lecttus) except peas, potatoes and corn will help keep the body of persons with COPD healthy and also gives them the required vitamins that reduces susceptibility to respiratory infections like COVID-19 (Janchote & Butler, 2020). Also, Lehouck *et al.* (2012) states that vitamin D has a positive role in reducing respiratory infections and exacerbations in COPD patients. While Berthon and Wood (2015) states that ginger diets contains vitamins C and E that synergistically works to give protection against the risk of airways inflammation in the elderly with COPD.

The result in Table 2 revealed a grand mean score of 3.06 which indicated that the extent intake of diets with the required potassium aids in the treatment of elderly COPD patients infected with COVID-19 in Port Harcourt, Rivers State includes: ugu intake help improve blood circulation in the lungs of COPD patients, ginger and tomato helps fight throat infection that increases the severity of COVID-19, regular intake of tomatoes and lemon helps in lung function that eases the effect of COVID-19 on elderly COPD patients, spinach and lecttus helps to eliminate toxins in the body, tomatoes contain lycopene which helps reduce airway inflammation that adversely affects COVID-19 patients, thyme helps clear out mucus and improves breathing rate, and ginger and garlic helps to break down mucus that makes it easy for the body to expel air. This finding is in

agreement with earlier finding by Mpatino (2015) that fruits (such as ginger, garlic, and tomatoes) and non-starchy vegetables (like ugu, lecttus, spinach and cabbage) contains potassium that provide natural cures or remedies for improved blood circulation and function in the lung that assists individuals with COPD to take a deep breath. Also, Gray (2017) states that regular intake of apples and tomatoes improves lung function especially for older people liable or at-risk of developing respiratory diseases like COPD. The finding corroborates with Rana (2018) that the daily intake of tomatoes (as a lycopene-rich fruit) in diets aids in preventing respiratory illness. Hoyt (2018) that turmeric and ginger has anti-inflammatory properties and an "active ingredient known as curcumin which gives the food spice its oomph against breathing problems

The result in Table 3 revealed a grand mean score of 3.10 which indicated that the extent intake of diets with the required minerals aids in the treatment of elderly COPD patients infected with COVID-19 in Port Harcourt, Rivers State includes: ginger and garlic reliefs COVID-19 patients from the dangers of airway and lung inflammation or swelling, garlic acts as antibiotics that help break up congestion that can affect the lungs and breathing of COVID-19 patients, ginger contain minerals that help to keep the lungs strong and improve the breathing of people with COPD, turmeric contains curcumin which provides the oomph against breathing problems for COVID-19 patients, high sodium or salty diets increases water retention which may affect the ability of COVID-19 patients to breathe, garlic help remove toxins that damage the inner linings of the blood vessels that causes low oxygen in COVID-19 patients, and tiger nut and coconut contain fibre that help improve COVID-19 patients ability to breathe and retain energy for physical activity.

This finding agrees with Chilukoti (2014) that garlic or lasoon contain minerals that helps in preventing and treatment for respiratory problems including ailments such as COPD and asthma. This is evident in the intake of turmeric which contains curcumin that aids the lung health (Maucere, 2019). Similarly, the finding aligns with Asouzu (2017) who stated that avoidance of high-sodium diet suffice as a self-care dietary formula, prescription or recipe expected to boost immunity against increased water retention which predispose individuals with respiratory infections or diseases to breathing difficulties. Alongside that by Kreb-Holms (2019) states that ginger (*otherwise Zingiber officinale*, Zingiberaceae) is a herb that contains minerals that upon intake helps improve chest congestion, aid respiratory illnesses, reduces airway inflammation, keep lung strong, and help relieve respiratory infections like COVID-19.

The result in Table 4 revealed a grand mean score of 3.12 which indicated that the extent intake of diets with the required protein aids in the treatment of elderly COPD patients infected with COVID-19 in Port Harcourt, Rivers State includes: ewi or rabbit contains proteins that improves constant flow of oxygen which helps patients with chronic lung diseases, ugba and ukwa contains proteins that help get rid of mucus that can reduce the breathing of patients with COVID-19, soyabean helps control weight that cause breathing problem for persons with respiratory infection like COVID-19, regular intake of akidi can help reduce breathing problems in people

with COPD, turmeric contain curcumin that can prevent the activation of inflammation-causing proteins, ogazi or guinea fowl and egg contains proteins that increases immunity against the severity of respiratory diseases or infections like COVID-19, and obojo fish contains high protein that help breakdown mucus that relieve coughs that can worsen COVID-19.

This finding is consistent with previous results of Berthon and Wood (2015) that healthily prepared and essential protein (like ugba, ukwa, and soyabean) diets aids in weight control and boosting immunity that could help in fighting respiratory infection and breaking down mucus likely to intensify cough that affects COVID-19 patients. This finding also corroborates with the assertion of Janchote and Butler (2020) that high intake of protein rich foods (like meat, poultry, and fish), and sparing intake of egg and beans constitute healthy nutritional tips that helps prevent breathing problems for elderly COPD patients with COVID-19.

### **Conclusion**

The study concludes that fruits (like oranges, coconut, sour sop, lemon and avocado), non-starchy vegetables (like ugu, spinach, tiger nut, lectus, carrot, tomatoes, ginger, garlic, and turmeric), including other foods like ugba, ukwa, akidi, soyabean, ogazi or guinea fowl and its egg, obojo fish and ewi or rabbit were the denizen, native or local foods or diets found in the study. The intake of these local diets whether fresh, dried, ground as powder, juiced, and cooked as liquid, solid, and spice should give the required or essential vitamins C, D and E, potassium, minerals, and proteins needed to increase or boost immunity for: fighting airway inflammatory, keeping the lung strong, and preventing breathing problems that can induce complications likely to worsen the health of elderly COPD patients infected with COVID-19.

Furthermore, the intake or consumption of the right local or indigenous foods (otherwise correct dietary factors/patterns) would have positive effect in controlling complications and severity of respiratory infections like COVID-19 on elderly patients with underlying chronic obstructive pulmonary disease. Hence, appropriate nutrition and dietary or eating outline or guideline significantly play great roles in improving the health, liveliness, longevity, and immunity level of elderly COPD patients susceptible to one of the many or multiple hitches like lung inflammation, breathing difficulties, etc. predisposing respiratory infections like COVID-19.

### **Recommendations**

1. Nutritionists and dieticians should embark on a detailed compilation of local diets rich in the required level of vitamins, minerals, potassium and protein that would benefit elderly COPD patients infected with a respiratory infection like COVID-19.
2. Local or native fibre-rich fruits (like oranges, coconut, sour sop, lemon and avocado) should be regularly consumed in order to help regulate weight gain that leads elderly persons with COPD to severe respiratory difficulties and complications.

3. Elderly persons are encouraged to eat, blend or spice local vegetables (like ugu, spinach, tiger nut, lectus, tomatoes, ginger, garlic, and turmeric) into their diets; due to their anti-weight and anti-inflammatory potentials that is helpful for COPD patients with COVID-19.
4. Elderly COPD patients are advised to desist from the intake of high salt with its attendant rising water retention that erupts breathing difficulties and the severity of COVID-19 complications.
5. Local protein-rich diets like ugba, ukwa, akidi, soyabean, ogazi, egg, obojo fish and ewi should be consumed in view of its effect in improving constant flow of oxygen and breaking down mucus that causes breathing problems for patients with chronic lung diseases.
6. Persons with COPD are encouraged to avoid the intake of fruits like apple, apricots, and melons that predisposes them to breathing problems and severity of COVID-19.

### **Conflict of Interest**

The authors declare no conflict of interest.

### **REFERENCES**

- Andersson, I.; Grönberg, A.; Slinde, F.; Bosaeus, I. & Larsson, S. (2007). Vitamin and mineral status in elderly patients with chronic obstructive pulmonary disease. *Clin. Respir. J.*, 1, 23–29.
- Arentz, M.; Yim, E.; Klaff, L.; Lokhandwala, S.; Riedo, F. X. & Chong, M. (2020). Characteristics and outcomes of 21 critically ill patients with COVID-19 in Washington state. *JAMA*. 2020 [Epub ahead of print, Accessed March 19, 2020]
- Asouzu, A. I. (2014). *Development of recipes from local dietary fibre rich foodstuffs for women with obesity challenges in Enugu State, Nigeria*. Unpublished Ph.D. Thesis submitted to the University of Nigeria, Nsukka.
- Asouzu, A. I. (2017). Knowledge of therapeutic foods for hypertensive female teachers in Port Harcourt, Rivers State, Nigeria. *RIK International Journal of Science and Technological Research (RIK-IJSTR)*, 3(3), 103-117.
- Bah, E. I.; Lamah, M. C.; Fletcher, T.; Jacob, S. T.; Brett-Major, D. M. & Sall, A. A. (2015). Clinical presentation of patients with Ebola virus disease in Conakry, Guinea. *N Engl J Med.*, 372, 40-47.
- Barazzoni, R.; Bischoff, S. C.; Krznaric, Z.; Pirlich, M. & Singer, P. (2020). ESPEN experts statements and practical guidance for nutritional management of individuals with SARS-CoV-2 infection. *Clin Nutr.* 2020 [epub ahead of print, Accessed March 31, 2020]
- Berthon, B. S. & Wood, L. G. (2015). Nutrition and respiratory health. *Nutrients*, 7(3), 1618–1643.
- Chilukoti, B. (2014). *Eat garlic to keep respiratory diseases at bay*. Health, September 25, 2014.

- Cohen, J. (2014). Saving lives without new drugs. *Science*, 246, 911.
- Foongm R. & Zosky, G. (2013). Vitamin D deficiency and the lung: Disease initiator or disease modifier? *Nutrients*, 5, 2880–2900.
- Gray, N. (2017). Breathing easy: Regular intake of apples and tomatoes could help lung function. *European Respiratory Journal*, 22, 134-142.
- Holick, M. F. (2007). Vitamin D deficiency. *N. Engl. J. Med.*, 357, 266–281.
- Janchote, C. & Butler, N. (2020). *COPD nutrition guide: 5 diet tips for people with chronic obstructive pulmonary disease*. New York: Healthline.
- Kreb-Holms, L. (2019). Ginger: Health benefits, nutrition, and recipes. *eMediHealth*, 210.
- Lehouck, A.; Mathieu, C.; Carremans, C.; Baeke, F.; Verhaegen, J.; Van Eldere, J.; Decallonne, B.; Bouillon, R.; Decramer, M.; & Janssens, W. (2012). High doses of vitamin D to reduce exacerbations in chronic obstructive pulmonary disease: A randomized trial. *Ann. Intern. Med.*, 156, 105-114.
- National Population Commission (2006). *2006 population and housing census of the Federal Republic of Nigeria 2006 Census: Priority tables*. Abuja (Nigeria): National Population Commission.
- National Population Commission (2016). *Federal Government of Nigeria Official Gazette and projection of the 2006 census report*. Abuja (Nigeria): National Population Commission.
- Nwankwo, O. C. (2013). *A practical guide to research writing: For students of research enterprise (Revised 5th Edition)*. Choba, Port Harcourt: University of Port Harcourt Press Limited.
- Peng, Y. D.; Meng, K.; Guan, H. Q.; Leng, L.; Zhu, R. R. & Wang, B. Y. (2020). Clinical characteristics and outcomes of 112 cardiovascular disease patients infected by 2019-nCoV. *Zhonghua Xin Xue Guan Bing Za Zhi.*, 48, E004.
- Rana, S. (2018). Tomatoes for respiratory illness: How to use this lycopene-rich fruit in your daily diet. *European Respiratory Journal*, 23(3), 254-267.
- Seyedrezazadeh, E.; Moghaddam, M. P.; Ansarin, K.; Vafa, M. R.; Sharma, S. & Kolahdooz, F. (2014). Fruit and vegetable intake and risk of wheezing and asthma: A systematic review and meta-analysis. *Nutr. Rev.*, 72, 411–428.
- Shaheen, S. O.; Jameson, K. A.; Syddall, H. E.; Aihie-Sayer, A.; Dennison, E. M.; Cooper, C. & Robinson, S. M. (2010). Hertfordshire Cohort Study Group: The relationship of dietary patterns with adult lung function and COPD. *Eur. Respir. J.*, 36, 277–284.
- Sissons, B. & Biggers, A. (2020). *COVID-19 and COPD*. New York: Medical News Today.

Varraso, R. (2012). Nutrition and asthma. *Curr. Allergy Asthma Rep.*, 12, 201–210.

Wassall, H.; Devereux, G.; Seaton, A. & Barker, R. (2013). Complex effects of vitamin E and vitamin C supplementation on *in vitro* neonatal mononuclear cell responses to allergens. *Nutrients*, 5, 3337–3351.

Wood, L. G.; Garg, M. L.; Smart, J. M.; Scott, H. A.; Barker, D. & Gibson, P. G. (2012). Manipulating antioxidant intake in asthma: A randomized controlled trial. *Am. J. Clin. Nutr.* 96, 534–543.

Zhou, F.; Yu, T.; Du, R.; Fan, G.; Liu, Y. & Liu, Z. (2020). Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: A retrospective cohort study. *Lancet.*, 395, 1054–1062.

IJSER