

## Factors Affecting Dietary Intake and Physical Activities of Primary Health Care Workers in Nasarawa State Nigeria

Iliyasu Tunga Salihu<sup>1\*</sup>, Adedayo Olubunmi Adeyemi<sup>2</sup>

<sup>1</sup>Department of Public Health, Texila American University, Guyana

<sup>2</sup>Director of Research, Monitoring and Evaluation, Department of Monitoring and Evaluation, Center for Infectious Diseases Research and Evaluation, Abuja, Nigeria

### Abstract

*This study adopted a cross-sectional study design and deployed a quantitative methodology to assess the factors affecting dietary intake and physical activities in Nasarawa state. The questionnaire was adapted as an instrument for data collection. 400 respondents were sampled through a multistage sampling technique and 300 were interviewed with the aid of the epi-info mobile data collection tool. Data from the field survey were presented in frequency and simple percentages informed by tables and charts. The study reveals that Location and Level of income are some of the basic factors affecting dietary intake and physical exercise among Primary Health Care workers in Nasarawa state however, it was also observed that income and location do not necessarily affect dietary intake and physical exercise all the time, but motivation could also play a role most especially in maintaining good physical activity. The study also reveals that PHC staff in Nasarawa state may be aware of their daily exercise and diet needs theoretically but in practice, they don't "practice what they preach". It was concluded that Primary health care workers in Nasarawa state maintain a poor level of diet and physical activities, dietary intake and physical activities affect the performance of PHC staff, and PHC workers don't practice and maintain good diet and physical activity habits, there is a need for promotion of health education activities related to diet and physical activities at PHC level across the state to inspire and motivate PHC staff to take up healthy diet and exercise habit.*

**Keywords:** *Affect, Dietary, Exercise, Habit, Healthy, Intake, Physical, study, Planned, Performance.*

### Introduction

A healthy diet helps protect against malnutrition and diet-related non-communicable diseases such as diabetes, heart disease, stroke, and cancer [1]. An adequate diet and required physical activity remained vital for human growth and development. Inadequate diet intake is associated with cardio-metabolic risk factors which cause high blood pressure, high blood glucose level, high insulin level, and lipid profile [2] as blood pressure rises so does the risk of heart disease and stroke [3].

The Global Burden of diseases that are diet and lifestyle-related choices stands at 71.3% of

deaths in 2015 as compared to only 57.6% in 1990 [4].

There is compelling evidence across many nations to suggest that the proportion of physically inactive individuals is high and is increasing [5]. The economic burden of sedentary is large. Globally, almost 500 million (499,208 million) new cases of preventable Non-Communicable Diseases will occur between 2020 and 2030, incurring treatment costs of over US\$ 300 billion (INT\$ 524 billion) or around US\$ 27 billion (INT\$ 48 billion) annually if there is no change in the current prevalence of physical inactivity. Nearly half of these new cases of NCDs (47%) will result from

Received: 13.09.2023

Accepted: 05.12.2023

Published on: 29.12.2023

\*Corresponding Author: salihuiliyast@gmail.com

hypertension, and 43% will result from depression. Three-quarters of all cases will occur in lower- and upper-middle-income countries. The largest economic cost is set to occur among high-income countries, which will account for 70% of healthcare expenditure on treating illnesses resulting from physical inactivity [6].

Obesity is a major public health concern that needs to be addressed using interventions that are accessible to children and adolescents along with focusing on the various factors that are involved such as environment [7, 8].

Regular Physical activity and exercise can help you stay healthy, energetic, and independent as you get older. Exercise plays a vital role in preventing health diseases and stroke [9].

It is perceived that health workers may not be actively watching their dietary intake and physical exercise in Nasarawa State. Thus, there is a need to examine the factors affecting the good practice of dietary intake and physical exercise among primary health care workers in the primary health care centers in 147 wards across the 13 Local Government Areas in the state.

This study will go a long way in ensuring that the health workers are healthy to take care of their patients, clients, catchment population they cover and become better role models on dietary intake with routine exercise towards improving the health of the public.

Improving Nutrition is core to Global Development which is also critical in achieving Sustainable Development Goals (SDGs). The SDGs look at the Global commitment to address malnutrition and hunger. The aims are generally to end hunger, enhance food security and improve nutrition (SDG-2). Success in Nutrition is linked to all the SDGs and a foundation to improve health and end poverty, addressing clean water and sanitation, renewable energy, education, gender equity, and so on is sacrosanct [10].

People who regularly participate in moderate amounts of physical activity and fitness can live

longer and healthier and, and physical activity and fitness not only help prevent illness and diseases but also promote quality of life [11]. It is on this premises that the study is designed to assess the level of dietary intake and exercise among the Primary Health Care center workers in Nasarawa State.

This study covers all public health care center staff on the government payroll and trained volunteers in Nasarawa state who consult or take care of the primary health center registers. It is generally known that a lack of routine exercise could lead to certain medical conditions that can affect certain life physiological functioning. Health Workers are viewed by the public to be role models in every aspect of health including health promotion activities and practice [12] hence the need to conduct a survey that will keep them abreast of their daily dietary needs and exercise to stay healthy to perform their daily job role.

Several social factors and lifestyles could be associated with diet and exercise-related diseases, these factors include gender, year of education, and college, which were significantly associated with physical activity [13], age, education, and diet pattern (intakes of food groups) are important determinants of nutrition and physical activity knowledge [14]. This study investigates the primary health care gatekeepers (Primary Health Care Workers) social life concerning diet and exercise habits which will help boost the health and wellness of PHC Staff.

The study will enable the population accessing services at the PHC level to take up healthy diet and physical exercise habits.

The study can serve as a think tank for the government and policymakers in terms of policy formulations related to diet and physical activities at the PHC level in Nigeria.

This study was limited by time and finance as the study is very elaborate and has to be concluded within a given time frame, communal clashes, inter-tribal crises, crime like kidnapping, armed robbery in some parts of the state, and poor access roads in some part of the

state make some of the health facility at ward level ‘hard to reach’ at the time of the survey thus reducing the study calculated sample data size of 400 to 300 data being collected.

## Materials and Methods

A cross-sectional study design [15] was implored and the participants were selected across Primary Health Care Centers in Nasarawa State to determine the factors affecting diet and exercise to breach identified gaps among PHC Center workers in Nasarawa State. Epi-info was deployed to collect data for this survey because the studies involve investigating dietary/nutritional intake and exercise patterns among Primary Health Care Workers, hence the need to collect quality data from multiple locations to be analyzed verbatim using the same database software to minimize data entry errors during data entry and analysis. Semi-structured standardized interviewer-administered, electronic questionnaires adapted from similar studies and validated before data collection. The contact data was collected face-to-face with the respondents. The sample size for this study was determined using the formula,

$$N = \frac{z^2 (pq)}{d^2}$$

where, N= Sample size; P= 20.3, (Prevalence of health state from previous literature); q= 80 (100-p); d= 4, (Relative Precision probability (z value from the probability table, and substituting the above in the formula gave:

$$N = \frac{2^2 (20 \times 80)}{4^2}$$

$$\frac{4 (1600)}{16} = 400.$$

Therefore, the sample size for this study was 400, being the largest sample size obtained based

on the research objective. A multistage sampling technique was used to select respondents for the study. Two PHC Centers per ward [16] across 147 political wards in Nasarawa State were used for this study. But in a situation where only one PHC is found in a ward two health workers will be selected and interviewed by the sampling technique. Two PHC Centers trained healthcare workers per ward across 147 political wards in Nasarawa State with complete contact addresses were randomly selected via multi-stage and stratified random sampling for the study until the desired sample size was achieved. In addition, three PHC-trained workers in each ward with more PHC centers were selected for interviews. Data quality checks such as pre-defined values (code sets) for categorical data, range restrictions for numeric data, and logic checks were implemented to avoid data duplication and other data entry errors. Data was analyzed with epi-info v7 to test the hypothesis using 2\*2 tables and chi-square.

## Result

Table 1 display a 2x2 table and a single table of analysis of all record cross-tabulated by exposure to location (rural or urban environment) where the outcome was participation in a planned exercise program. Out of the 300 records in this data set, 89 (37.08%) PHC staff in a rural environment participated in a planned exercise program, and 151 (62.92%) PHC staff in a rural area did not follow a planned exercise program. While 26 (43.33%) PHC staff in urban environments followed the planned exercise program and 34 (56.67%) PHC staff duel in urban centers and do not follow a planned exercise program.

**Table 1.** 2X2 Table presenting the relationship between the location of PHC workers and following a planned exercise program.

Do you follow a planned exercise program?			
N6Location	Yes	No	
Rural	89	151	240
Row %	37.08%	62.92%	100.00%

Col %	77.39%	81.62%	80.00%
Urban	26	34	60
Row %	43.33%	56.67%	100.00%
Col %	22.61%	18.38%	20.00%
Total	115	185	300
Row %	38.33%	61.67%	100.00%
Col %	100.00%	100.00%	100.00%

Source: EPI7 data visualization dashboard (Physical exercise / Dietary intake and physical exercise)

Table 2 display a 2x2 table and a single table of analysis of all record cross-tabulated by exposure to location (rural or urban environment) where the outcome was participation in performing vigorous exercise at least 3 times a week. Out of the 300 records in this data set, 93 (38.75%) PHC staff in rural environments participated in exercising

vigorously at least 3 times a week, 147 (61.25%) PHC staff live in rural areas and did not Perform Exercise vigorously at least 3 times a week. While 30 (50.00%) PHC staff in urban environments performed exercise vigorously at least 3 times a week, and 30 (50.00%) PHC staff lived in urban centers and did not perform exercise vigorously at least 3 times a week.

Table 2. 2X2 Table Presenting the Relationship between the Location of PHC Workers and Performing Exercise Vigorously at least 3 Times a Week

<b>Do you exercise vigorously...?</b>			
<b>N6Location</b>	<b>Yes</b>	<b>No</b>	
Rural	93	147	240
Row %	38.75%	61.25%	100.00%
Col %	75.61%	83.05%	80.00%
Urban	30	30	60
Row %	50.00%	50.00%	100.00%
Col %	24.39%	16.95%	20.00%
Total	123	177	300
Row %	41.00%	59.00%	100.00%
Col %	100.00%	100.00%	100.00%

Source: EPI7 data visualization dashboard (Physical exercise/Dietary intake and physical exercise)

Table 3 shows that in the rural areas, 188 (78.33%) of the sample size are aware of what to eat daily while 52 (21.67%) do not. However, in the urban centers, 54 (90%) are aware, while 6 (10%) are not aware of what to eat daily.

Out of the 300 records in this data set, 89 (37.08%) PHC staff in rural environments participated in a planned exercise program, and 151 (62.92%) PHC staff in rural areas did not follow a planned exercise program. While 26

(43.33%) PHC staff in urban environments followed the planned exercise program and 34 (56.67%) PHC staff lived in urban centers and did not follow a planned exercise. From this data, it can be deduced that staff who live in urban centers followed a planned exercise program more than PHC staff who live in rural areas. It can be concluded that location affects following a planned physical exercise program by PHC staff.

**Table 3.** Cross-Tabulation of Location and being Aware of What to Eat Daily

<b>N17 Are you aware of what you are eating daily?</b>			
<b>N6Location</b>	<b>Yes</b>	<b>No</b>	
Rural	188	52	240
Row %	78.33%	21.67%	100.00%
Col %	77.69%	89.66%	80.00%
Urban	54	6	60
Row %	90.00%	10.00%	100.00%
Col %	22.31%	10.34%	20.00%
Total	242	58	300
Row %	80.67%	19.33%	100.00%
Col %	100.00%	100.00%	100.00%

Table 4 indicates that 61 (25.42%) of the PHC workers living in rural areas consume fried and frozen food, and 179 (74.58%) of them do not

consume fried and frozen food. While in the urban cities, 22 (36.67%) of them consumed fried and frozen food and 38 (63.33%) did not.

**Table 4.** Cross Tabulation of Location and Consumption of Fried and Frozen Food

<b>Fried Frozen food</b>			
<b>N6Location</b>	<b>Yes</b>	<b>No</b>	
Rural	61	179	240
Row %	25.42%	74.58%	100.00%
Col %	73.49%	82.49%	80.00%
Urban	22	38	60
Row %	36.67%	63.33%	100.00%
Col %	26.51%	17.51%	20.00%
Total	83	217	300
Row %	27.67%	72.33%	100.00%
Col %	100.00%	100.00%	100.00%

Table 5 indicates that 142 (59.17%) of PHC workers living in rural areas eat goat and cow meat while 98 (40.83%) of them do not.

However, in the urban areas, 42 (70.00%) of them consumed goat and cow meat, and 18 (30.00%) of them did not.

**Table 5.** Cross Tabulation of Location and Consumption of Mutton/Beef Meat

<b>Goat/ Cow meat</b>			
<b>N6Location</b>	<b>Yes</b>	<b>No</b>	
Rural	142	98	240
Row %	59.17%	40.83%	100.00%
Col %	77.17%	84.48%	80.00%
Urban	42	18	60
Row %	70.00%	30.00%	100.00%
Col %	22.83%	15.52%	20.00%
Total	184	116	300
Row %	61.33%	38.67%	100.00%
Col %	100.00%	100.00%	100.00%

From Table 6, we can see that in the rural areas, 91 (37.92%) of the PHC workers consumed more than one teaspoon of salt daily

while 149 (62.08%) did not. In the urban areas, 24 (40.00%) consumed more than one teaspoon daily and 36 (60.00%) did not.

**Table 6.** Cross-tabulation of Location and the Consumption of more than One Teaspoon of Salt Daily

<b>N12 Do you consume more than one teaspoon of salt daily?</b>			
<b>N6Location</b>	<b>Yes</b>	<b>No</b>	
Rural	91	149	240
Row %	37.92%	62.08%	100.00%
Col %	79.13%	80.54%	80.00%
Urban	24	36	60
Row %	40.00%	60.00%	100.00%
Col %	20.87%	19.46%	20.00%
Total	115	185	300
Row %	38.33%	61.67%	100.00%
Col %	100.00%	100.00%	100.00%

The Table 7 illustrates to us that in the rural areas, 113 (47.08%) of PHC workers do not consume fruits and vegetables daily, 62 (25.83%) consume once daily, 17 (7.08%) consume two times daily, 4 (1.67%) consumed three times daily, 41 (17.08%) consumed four times daily, and 3 (1.25%) consumed five times daily. However, in the urban areas, 25 (41.67%) did not consume fruits and vegetables once daily, 18 (30%) consumed once daily, 12 (20%)

consumed twice daily, 1 (1.67%) consumed three times daily, and 4 (6.67%) consumed four times daily.

Similarly, from the Table 7, at chi-square 13.1254 and Fishers exact 0.0261 at a p-value of 0.0222 with 5 df which is smaller than the alpha value of 0.05, therefore, there is a significant association between location and the consumption of fruits and vegetables.

**Table 7.** Cross Tabulation of Location and the Consumption of Fruits and Vegetables

	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>Total</b>
<b>Rural</b>	113	62	17	4	41	3	240
	47.08%	25.83%	7.08%	1.67%	17.08%	1.25%	100.00%
	81.88%	77.50%	58.62%	80.00%	91.11%	100.00%	80.00%
<b>Urban</b>	25	18	12	1	4	0	60
	41.67%	30.00%	20.00%	1.67%	6.67%	0.00%	100.00%
	18.12%	22.50%	41.38%	20.00%	8.89%	0.00%	20.00%
<b>Total</b>	138	80	29	5	45	3	300
	46.00%	26.67%	9.67%	1.67%	15.00%	1.00%	100.00%
	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
<b>Chi-square</b>	<b>Df</b>		<b>Probability</b>				
13.1254	5		0.0222				
<b>Fisher's Exact</b>			0.0261				

The Table 8 illustrated that 54 (39.71%) of PHC workers earning between 30000-50000 performed vigorous exercise at least 3 times a

week while 82 (60.29%) did not perform vigorous exercise at least 3 times a week, 24 (50.00%) of PHC workers earning between

51000-70000 performed vigorous exercise at least 3 times a week while 24 (50.00%) do not perform vigorous exercise at least 3 times a week. 17 (37.78%) of PHC workers earning between 71000-90000 performed vigorous exercise at least 3 times a week while 28 (62.22%) did not perform vigorous exercise at least 3 times a week. Lastly, 23 (35.94%) of PHC workers earning between 91000 and above

performed vigorous exercise at least 3 times a week, while 41 (64.06%) did not perform vigorous exercise at least 3 times a week.

Similarly, from the Table 8, at chi-square 2.5228 and Fishers exact 0.4770 at a p-value of 0.4712 with 3 of which is smaller than the alpha value of 0.05, therefore, there is a significant association between income and performing vigorous exercise at least 3 times a week.

**Table 8.** Cross-tabulation of Monthly Income and Performing of Vigorous Exercise at least 3 Times a Week

	<b>Yes</b>	<b>No</b>	<b>Total</b>
<b>0</b>	54	82	136
	39.71%	60.29%	100.00%
	45.76%	46.86%	46.42%
<b>1</b>	24	24	48
	50.00%	50.00%	100.00%
	20.34%	13.71%	16.38%
<b>2</b>	17	28	45
	37.78%	62.22%	100.00%
	14.41%	16.00%	15.36%
<b>3</b>	23	41	64
	35.94%	64.06%	100.00%
	19.49%	23.43%	21.84%
<b>Total</b>	118	175	293
	40.27%	59.73%	100.00%
	100.00%	100.00%	100.00%
<b>Chi-square</b>		<b>Df</b>	<b>Probability</b>
2.5228		3	0.4712
<b>Fisher's Exact</b>			0.4770

The Table 9 shows that 54 (39.71%) of PHC workers earning around 30000-50000 followed a planned exercise program 82 (60.29%) do not follow a planned exercise program, 17 (35.42%) of PHC workers earning around 51000-70000 followed a planned exercise program while 31 (64.58%) do not follow a planned exercise program. 19 (42.22%) of PHC workers earning between 71000-90000 followed a planned exercise program while 26 (57.78) did not follow a planned exercise program. 22 (34.38%) of

PHC workers earning around 91000 and above followed a planned exercise program while 42 (65.63%) did not follow a planned exercise program.

Similarly, from the Table 9, at chi-square 0.9928 and Fisher's exact 0.8111 at a p-value of 0.8030 with 3 df which is smaller than the alpha value of 0.05, therefore, there is a significant association between income and following a planned exercise program.

**Table 9.** Cross-tabulation of Monthly Income and Following of Planned Exercise Program

	<b>Yes</b>	<b>No</b>	<b>Total</b>
<b>0</b>	54	82	136
	39.71%	60.29%	100.00%
	48.21%	45.30%	46.42%
<b>1</b>	17	31	48
	35.42%	64.58%	100.00%
	15.18%	17.13%	16.38%
<b>2</b>	19	26	45
	42.22%	57.78%	100.00%
	16.96%	14.36%	15.36%
<b>3</b>	22	42	64
	34.38%	65.63%	100.00%
	19.64%	23.20%	21.84%
<b>Total</b>	112	181	293
	38.23%	61.77%	100.00%
	100.00%	100.00%	100.00%
<b>Chi-square</b>	<b>Df</b>	<b>Probability</b>	
0.9928	3	0.8030	
<b>Fisher's Exact</b>	-	0.8111	

The Table 10 illustrates that out of the 300 PHC workers sampled, those earning around 30000-50000 consumed fried/frozen food are, 36 (26.47%) and those that did not consume fried/frozen food within that earning rate are 100 (73.53%), those earning around 51000-70000 that consumed fried/frozen food are, 14 (29.17%) and those that do not consumed fried/frozen food within that earning rate are 34 (70.83%), those earning around 71000-90000 that consumed fried/frozen food are, 15 (33.33%) and within that earning range that do

not consumed fried/frozen food are, 30 (66.67%), lastly, those that earned around 91000 and above that consumed fried/frozen food are, 17 (26.56%) and those within that earning range that do not consumed fried/frozen food are 47 (73.44%).

Similarly, from the Table 10, at chi-square 0.8910 and Fisher's exact 0.8247 and p-value of 0.8276 3 of which is smaller than the alpha value of 0.05, therefore, there is a significant association between income and the consumption of fried/frozen food.

**Table 10.** Cross Tabulation of Monthly Income and the Consumption of Fried/Frozen Food

	<b>Yes</b>	<b>No</b>	<b>Total</b>
<b>0</b>	36	100	136
	26.47%	73.53%	100.00%
	43.90%	47.39%	46.42%
<b>1</b>	14	34	48
	29.17%	70.83%	100.00%
	17.07%	16.11%	16.38%
<b>2</b>	15	30	45
	33.33%	66.67%	100.00%
	18.29%	14.22%	15.36%



<b>3</b>	17	47	64
	26.56%	73.44%	100.00%
	20.73%	22.27%	21.84%
<b>Total</b>	82	211	293
	27.99%	72.01%	100.00%
	100.00%	100.00%	100.00%
<b>Chi-square</b>	<b>Df</b>	<b>Probability</b>	
0.8910	3	0.8276	
<b>Fisher's Exact</b>	-	0.8247	

The Table 11 illustrates that out of the 300 PHC workers sampled, those earning around 30000-50000 that skipped meals are, 57 (41.91%), and those that do not skip meals within that earning rate are 79 (58.09%), those earning around 51000-70000 that skipped meals are, 22 (45.83%) and those that do not skip meals within that earning rate are 26 (54.17%), those earning around 71000-90000 that skipped meals are, 21 (46.67%) and within that earning range

that does not skip meals are, 24 (53.33%), lastly, those that earned around 91000 and above that skipped meals are, 297 (45.31%) and those within that earning range that do not skip meals are 35 (54.69%). Similarly, from Table 11, at chi-square 0.4806 and Fisher's exact 0.9246 and p-value of 0.9231 with 3df of which is smaller than the alpha value of 0.05, therefore, there is a significant association between income and skipping of meals.

**Table 11.** Crosstabulation of Monthly Income and Skipping of Meals

	<b>Yes</b>	<b>No</b>	<b>Total</b>
<b>0</b>	57	79	136
	41.91%	58.09%	100.00%
	44.19%	48.17%	46.42%
<b>1</b>	22	26	48
	45.83%	54.17%	100.00%
	17.05%	15.85%	16.38%
<b>2</b>	21	24	45
	46.67%	53.33%	100.00%
	16.28%	14.63%	15.36%
<b>3</b>	29	35	64
	45.31%	54.69%	100.00%
	22.48%	21.34%	21.84%
<b>Total</b>	129	164	293
	44.03%	55.97%	100.00%
	100.00%	100.00%	100.00%
<b>Chi-square</b>	<b>Df</b>	<b>Probability</b>	
0.4806	3	0.9231	
<b>Fisher's Exact</b>		0.9246	

Out of the 300 records in this data set, 93 (38.75%) PHC staff in rural environments participated in exercising vigorously at least 3 times a week, 147 (61.25%) PHC staff in rural

areas did not perform exercise vigorously at least 3 times a week. While 30 (50.00%) PHC staff lived in an urban environment and performed exercise vigorously at least 3 times a week, and

30 (50.00%) PHC staff dueded in urban centers and did not perform exercise vigorously at least 3 times a week. From this data, it can be deduced that staff who live in urban centers followed a planned exercise vigorously at least 3 times a week more than PHC staff who live in rural areas. It can be concluded that location affects exercising vigorously at least 3 times a week.

In addition to the findings above it can be concluded that location can affect the physical activities of PHC staff, more so participation in physical activity could be a result of personal motivation.

54 (39.71%) of PHC workers earning between 30000-50000 performed vigorous exercise at least 3 times a week while 82 (60.29%) did not perform vigorous exercise at least 3 times a week, 24 (50.00%) of PHC workers earning between 51000-70000 performed vigorous exercise at least 3 times a week while 24 (50.00%) do not perform vigorous exercise at least 3 times a week. 17 (37.78%) of PHC workers earning between 71000-90000 performed vigorous exercise at least 3 times a week while 28 (62.22%) did not perform vigorous exercise at least 3 times a week. Lastly, 23 (35.94%) of PHC workers earning between 91000 and above performed vigorous exercise at least 3 times a week, while 41 (64.06%) did not perform vigorous exercise at least 3 times a week. It can be deduced that PHC staff who earn less and those who earn higher performed less vigorous exercise than those who earn average, it can be concluded that Income affects one level of exercise.

64 (26.67%) of PHC workers living in rural areas consume fast food while 176 (73.33%) of them do not consume fast food. Subsequently, in the urban areas, 22 (26.67%) of the PHC workers consume fast food and 38 (63.33%) of them do not consume fast food.

199 (82.92%) of PHC workers living in rural areas consume fish while 41 (17.08%) of them do not consume fish. However, in the urban areas, 56 (93.33%) of the PHC workers consume fish while 4 (6.67%) do not consume fish. 61

(25.42%) of the PHC workers living in rural areas consume fried and frozen food, and 179 (74.58%) of them do not consume fried and frozen food. While in the urban cities, 22 (36.67%) of them consumed fried and frozen food and 38 (63.33%) did not. 142 (59.17%) of PHC workers living in the rural area eat goat and cow meat while 98 (40.83%) of them do not. However, in the urban areas, 42 (70.00%) of them consumed goat and cow meat, and 18 (30.00%) of them did not.

In the rural areas, 113 (47.08%) of PHC workers do not consume fruits and vegetables daily, 62 (25.83%) consume once daily, 17 (7.08%) consume twice daily, 4 (1.67%) consume three times daily, 41 (17.08%) consume four times daily, and 3 (1.25%) consume five times daily. However, in the urban areas, 25 (41.67%) never consume fruits and vegetables daily, 18 (30%) consume once daily, 12 (20%) consume twice daily, 1 (1.67%) consume three times, and 4 (6.67%) consume four times daily. 179 (74.58%) eat processed food, while 61 (25.42%) of them do not. Meanwhile, in the urban areas, 47 (78.33%) consumed processed food and 13 (21.67%) do not. 35 (14.58%) of the sample size eat nuts and 205 (85.42%) do not.

Out of the 300 PHC workers sampled, those earning around 30000-50000 that take fish are 119 (87.50%) and those that do not consumed fish within that earning rate are 17 (12.50%), those earning around 51000-70000 that consumed fish are 41 (85.42%) and those that do not consumed fish within that earning rate are 7 (14.58%), those earning around 71000-90000 that consumed fish are 40 (88.89%) and within that earning range that do not consume fish are 5 (11.11%), lastly, those that earned around 91000 and above that consumed fish are 50 (78.13%) and those within that earning range that do not consume fish are 14 (21.88%).

Out of the 300 PHC workers sampled, those earning around 30000-50000 that consumed fast food are 39 (28.68%) and those that do not consume fast food within that earning rate are 97

(71.32%), those earning around 51000-70000 that consumed fast food 16 (33.33%) and those that do not consumed fast food within that earning rate are 32 (66.67%), those earning around 71000-90000 that consumed fast food 13 (20.31%) and within that earning range that do not consumed fast food 32 (71.11%), lastly, those that earned around 91000 and above that consumed fast food 13 (20.31%) and those within that earning range that do not consumed fast food 51 (79.69%).

Out of 300 PHC workers sampled, those earning around 30000-50000 consumed goat/cow meat are, 76 (55.88%) and those that do not consume goat/cow meat are within that earning rate 60 (44.12%), those earning around 51000-70000 that consumed goat/cow meat are, 34 (70.83%) and those that do not consume goat/cow meat are within that earning rate are 14 (29.17%), those earning around 71000-90000 that consumed goat/cow meat are, 29 (64.44%) and within that earning range that does not consumed goat/cow meat are, 16 (36.56%), lastly, those that earned around 91000 and above that consumed goat/cow meat are, 41 (64.06%) and those within that earning range that do not consumed goat/cow meat are 23 (35.94%).

Out of the 300 PHC workers sampled, those earning around 30000-50000 that take beverages once weekly are 60 (44.12%) 70 (51.47%) consumed beverages twice weekly, and 6 (4.41%) never consumed beverages. those earning around 51000-70000 that consumed beverages once weekly are 26 (54.17%), 20 (41.67%) consumed beverages twice weekly, 2 (4.17%) do not consume beverages 2 (4.17%), those earning around 71000-90000 that consumed beverages once a week are 19 (42.22%), 21 (26.67%) consumed beverages twice weekly and 5 (11.11%) do not consume beverages, lastly, those that earned around 91000 and above that consumed beverages once a week are 29 (45.31%), 32 (50.00%) consumed beverages twice weekly, and 3 (4.69%) do not consume beverages.

Out of the 300 PHC workers sampled, those earning around 30000-50000 consumed fried/frozen food are, 36 (26.47%), and those that did not consume fried/frozen food within that earning rate 100 (73.53%), those earning around 51000-70000 that consumed fried/frozen food are, 14 (29.17%) and those that do not consume fried/frozen food within that earning rate are 34 (70.83%), those earning around 71000-90000 that consumed fried/frozen food are, 15 (33.33%) and within that earning range that does not consumed fried/frozen food are, 30 (66.67%), lastly, those that earned around 91000 and above that consumed fried/frozen food are, 17 (26.56%) and those within that earning range that do not consumed fried/frozen food are 47 (73.44%).

Out of the 300 PHC workers sampled, those earning around 30000-50000 that consumed alcohol are, 3 (2.21%) and those that do not consume alcohol within that earning rate are 133 (97.79%), those earning around 51000-70000 that consumed alcohol are, 5 (10.42%) and those that do not consume alcohol within that earning rate are 43 (89.58%), those earning around 71000-90000 that consumed alcohol are, 5 (11.11%) and within that earning range that does not consume alcohol are, 40 (88.89%), lastly, those that earned around 91000 and above that consumed alcohol are, 7 (10.94%) and those within that earning range that do not consume alcohol are 57 (89.06%).

Out of the 300 PHC workers sampled, those earning around 30000-50000 that skipped meals are, 57 (41.91%) and those that do not skip meals within that earning rate are 79 (58.09%), those earning around 51000-70000 that skipped meals are, 22 (45.83%) and those that do not skip meals within that earning rate are 26 (54.17%), those earning around 71000-90000 that skipped meals are, 21 (46.67%) and within that earning range that does not skip meals are, 24 (53.33%), lastly, those that earned around 91000 and above that skipped meals are, 297 (45.31%) and those within that earning range that do not skip meals are 35 (54.69%).

Out of the 300 PHC workers sampled, those earning around 30000-50000 that consumed fruits and vegetables once daily are 62 (45.59%) 32 (23.53%) consumed fruits and vegetables twice daily, 14 (10.29%), consumed fruits and vegetables thrice daily, 3 (2.21%) consumed fruits and vegetables four times daily, 23 (16.91%) consumed fruits and vegetables once a week while 2 (1.47%) never consumed fruits and vegetables. those earning around 51000-70000 that consumed fruits and vegetables once weekly are 17 (35.47%), 20 (41.67%) consumed fruits and vegetables twice daily, 48.33% consumed fruits and vegetables trice daily, 2 (4.17%) consumed fruits and vegetables four times daily, 5 (10.42%) once a week, while 0 (0%) do not consumed fruits and vegetables), those earning around 71000-90000 that consumed fruits and vegetables once daily are 28 (62.22%), 7 (15.57%) consumed fruits and vegetables twice daily, 6 (13.33%) consumed fruits and vegetables trice daily 0 (0%) consumed fruits and vegetables four times daily, 3 (6.67%) consumed fruits and vegetables once a week, 1 (2.22%) do not consumed fruits and vegetables, lastly, those that earned around 91000 and above that consumed fruits and vegetables once daily are 26 (40.63%), 20 (31.25%) consumed fruits and vegetables twice daily, 4 (6.25%) consumed fruits and vegetables trice daily 0 (0%) consumed fruits and vegetables four times daily 14 (21.88%) consumed fruits and vegetables once a week, while 0 (0%) do not consumed fruits and vegetables. From the above it can be concluded that Location and Level of income are some of the basic factors affecting dietary intake and physical exercise among Primary Health Care workers in Nasarawa state however it was also observed that income and location do not necessarily affect dietary intake and physical exercise all the time, but motivation could also play a role most especially in maintaining good physical activity.

This finding is in line with Self-Determination Theory [17] which emphasizes the importance of focusing not just on quantity

but also on the quality of motivation to engage in behaviors such as a healthy diet and physical activity.

Moreover, the findings of this study can be further explained by the theory of planned behavior (TPB) which explains that participation in diet and physical activity is a function of a person's intention. This construct indicates how much effort people plan to exert toward the performance of the behavior. The intention is, in turn, a function of three variables, namely attitudes, subjective norms, and perceptions of control. Attitudes represent an overall positive or negative evaluation of behavior [18]. Subjective norms represent perceived influences that significant others, such as parents, peers, or teachers, may exert on the execution of behavior. Perceived behavioral control refers to general perceptions of control. The TPB also suggests that when perceptions of control are realistic, perceived behavioral control will predict diet and physical activity behavior directly alongside intentions [18]. In addition, the findings of this study correlate with the findings of a research by Thomas [19] "Dietary intake and its associated factors among in-school adolescents in Ghana" which concluded that there was low consumption of fruits and vegetables among adolescents.

## Conclusion

From the above analysis, it can be concluded that Location and Level of income are some of the basic factors affecting dietary intake and physical exercise among Primary Health Care workers in Nasarawa state however it was also observed that income and location do not necessarily affect dietary intake and physical exercise all the time, but motivation could also play a role most especially in maintaining good physical activity. This finding is in line with Self-Determination Theory [17] which emphasizes the importance of focusing not just on quantity but also on the quality of motivation to engage in behaviors such as a healthy diet and physical activity. Quantity of motivation is not

necessarily beneficial as some types of motivation reflect internal and external pressures for behavioral engagement. Such pressures might result in a high quantity of motivation but of low quality in terms of supporting long-term behavioral adherence and psychological well-being [20].

Moreover, the findings of this study can be further explained by the theory of planned behavior (TPB) which explains that participation in diet and physical activity is a function of a person's intention. This construct indicates how much effort people plan to exert toward the performance of the behavior. The intention is, in turn, a function of three variables, namely attitudes, subjective norms, and perceptions of control. Attitudes represent an overall positive or negative evaluation of behavior [18, 21]. Subjective norms represent perceived influences that significant others, such as parents, peers, or teachers, may exert on the execution of behavior. Perceived behavioral control refers to general perceptions of control. The TPB also suggests that when perceptions of control are realistic, perceived behavioral control will predict diet and physical activity behavior directly alongside intentions [18, 21].

In addition, the findings of this study correlate with the findings of a research by Thomas [20] "Dietary intake and its associated factors among in-school adolescents in Ghana" which concluded that there was low consumption of fruits and vegetables among adolescents. Thomas finds out that fruit and vegetable consumption was associated with gender, academic performance, and geographical location, and these may be a reflection that knowledge of healthy food choices and availability are important factors influencing dietary choices among in-school adolescents in Ghana. He believes that school health policy interventions aimed at improving nutritional status among adolescents and enhancing fruit and vegetable consumption in the country should consider the potential benefit of increasing the availability of fruits and vegetables in schools

while reducing access to sweets and soft drinks in the schools and communities.

From the findings of the study, it was concluded that Primary health care workers in Nasarawa state maintain poor levels of diet and physical activities, income and geographical location may affect their level of dietary intake and physical activities, and dietary intake and physical activities affect performance of PHC staff and that PHC workers don't practice and maintain good diet and physical activities habit, therefore there is need for promotion of health education activities related to diet and physical activities at PHC level across the state to inspire and motivate PHC staff to take up healthy diet and exercise habit. Government/stakeholders can promote healthy diet and physical activity among PHC staff through formulation of policies and provisions of IEC materials at the health facility level that can serve as a source of inspiration and motivation for PHC workers to take up healthy diet and exercise habits in the state.

### **Acknowledgment**

I humbly wish to show my gratitude to the almighty Allah who gave me the opportunity and talent to write out my research work in his infinite mercy and glory.

I wish to sincerely extend my gratitude to those who supported me throughout the study period especially my supervisors Dr. Adedayo Olubunmi Adeyemi, and Mr. Victor Alebura who supported me in coordinating data collection from the field, Dr. Usman Muhammad Adis who supported me tremendously as a mentor. Finally, special prayers to my parents, wives, children, and members of our family who supported me with advice, cash, and kind, moral, mental, and psychological, I wish you all, a long life and prosperity in future endeavors.

### **Conflict of Interest**

No conflict of interest was experienced during the survey.

## References

- [1] World Health Organization (WHO), 2019, “Healthy diet,” pp. 20, <https://.who.int/iris/bitstream/handle/10665/325828/EMROPUB-2019-en-23536.pdf/>
- [2] C. D. M. Cunha, P. R. F. Costa, L. P. M. De Oliveira, V. A. D. O. Queiroz, J. C. D. Pitangueira, and A. M. Oliveira, “Dietary patterns and cardiometabolic risk factors among adolescents: Systematic review and meta-analysis,” *British Journal of Nutrition*, vol. 119, no. 8. Cambridge University Press, pp. 859–879, Apr. 28, 2018. doi: 10.1017/S0007114518000533.
- [3] B. M. Margetts, P. Little, and D. Warm, “Interaction between physical activity and diet: Implications for blood pressure management in primary care,” *Public Health Nutr*, vol. 2, no. 3 A, pp. 377–382, 1999, doi: 10.1017/S1368980099000518.
- [4] Institute for Health Metric and Evaluation (IHME), 2017 “The Global Burden of diseases that are diet and lifestyle-related”, University of Washington. [Healthdata.org](http://Healthdata.org).
- [5] C. R. Nigg and K. S. Geller, “Theoretical Approaches to Physical Activity Intervention,” *The Oxford Handbook of Exercise Psychology*, no. May 2012, doi 10.1093/oxfordhb/9780195394313.013.0014.
- [6] World Health Organization (WHO), “Global status report on physical activity” 2022, <https://apps.who.int/iris/rest/bitstreams/1489640/retrieve>.
- [7] M. Blake, “Differences in food intake, nutrition knowledge, and fitness assessment measurements in high school students who have completed the Nutricise 4 life program and students who have not,” 2009.
- [8] “Healthy diet.” [Online]. Available: <http://www.who.int/mediacentre/factsheets/fs394/en/>.
- [9] M. A. Elmagd, “Benefits, need for and importance of daily exercise,” ~ 22 ~ *International Journal of Physical Education, Sports, and Health*, vol. 3, no. 5, pp. 22–27, 2016.
- [10] Sustainable Development Goals I IISD Perspectives on the 2030 Agenda for Sustainable Development Sustainable Development Goals,” 2016. [Online]. Available: [www.iisd.org](http://www.iisd.org).
- [11] I. O. Ayenigbara, “The contributions of physical activity and fitness for the optimal health and wellness of the elderly people,” *Journal of Gerontology and Geriatrics*, vol. 68, no. 1, pp. 40–46, 2020, doi: 10.36150/2499-6564-351.
- [12] C. E. Abadía-Barrero and M. Bugbee, “Primary Health Care for Universal Health Coverage? Contributions for a Critical Anthropological Agenda,” *Medical Anthropology: Cross-Cultural Studies in Health and Illness*, vol. 38, no. 5. Taylor and Francis Inc., pp. 427–435, Jul. 04, 2019. doi: 10.1080/01459740.2019.1620744.
- [13] G. N. Hailu, H. B. Gebru, and D. Siyoum Belay, “Assessment of Healthy Diet and Physical Activity Among Students of Mekelle University, Northern Ethiopia: A Cross-Sectional Study,” *Nutr Diet Suppl*, vol. Volume 13, pp. 103–112, 2021, doi: 10.2147/nds.s287278.
- [14] D. Pandit-Agrawal, A. Khadilkar, and S. Chiplonkar, “Knowledge of nutrition and physical activity in apparently healthy Indian adults,” vol. 21, no. 9, pp. 1743–1752, 2018, doi: 10.1017/S1368980017004268.
- [15] N. Walliman, “RESEARCH METHODS”: The Basics, 2nd Edition, 2017, Routledge, London, pp. 246, <https://doi.org/10.4324/9781315529011>.
- [16] “Primary health care Draft operational framework Primary health care: transforming vision into action.” [Online]. Available: <https://apps.who.int/iris/handle/10665/328065>.
- [17] E. L. Deci and R. M. Ryan, “Self-Determination Theory: A Macrotheory of Human Motivation, Development, and Health,” vol. 49, no. 3, pp. 182–185, 2008, doi: 10.1037/a0012801.
- [18] Ajzen, 1991, “Theory-of-Planned-Behaviour”, Centre for people building, pp 50, 179-211, <http://ascnhighered.org/ACSN/change-theories/collection/planned-behaviour.html>.
- [19] T. H. Id, “Dietary intake and its associated factors among in-school adolescents in Ghana,” pp. 1–13, 2022, doi: 10.1371/journal.pone.0268319.
- [20] T. Hormenu, “Dietary intake and its associated factors among in-school adolescents in Ghana,” *PLoS*

*One*, vol. 17, no. 5 May, May 2022, doi:  
10.1371/journal.pone.0268319.  
[21] N. Ntoumanis, C. Thørgersen-Ntoumani, E.  
Quested, and N. Chatzisarantis, “Theoretical

Approaches to Physical Activity Promotion,” in  
Oxford Research Encyclopedia of Psychology,  
Oxford University Press, 2018. doi:  
10.1093/acrefore/9780190236557.013.212.