



The Effectiveness of a Community Health Fair Screening Intervention in Okwu Emekuku- a Mixed Method Approach

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Article Info

Received: June 15, 2025

Accepted: August 23, 2025

Published: September 11, 2025

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Citation: Ijeaku I, Egu O, Brown C. (2025) "The Effectiveness of a Community Health Fair Screening Intervention in Okwu Emekuku- a Mixed Method Approach". International Journal of Epidemiology and Public Health Research, 7(3); DOI: 10.61148/2836-2810/IJEPHR/146.

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Abstract

Background:

The Declaration of Alma-Ata of 1978 VI is based on the notion that health is a fundamental human right and that all governments have the responsibility to provide health to citizens leading to the creation of primary health centers (PHC) as the cellular unit for equitable health care delivery. The Global Burden of Disease Study 2016 has the health ranking of Nigeria as 142nd out of 195 countries. Reasons for this include poor quality of health care services delivery which is due largely to poor budgetary allocation.

Objectives:

A health fair was conducted due to the poor quality of health care access in the rural community of Okwu Emekuku with the objectives of provision of preventive and urgent care, education about common public health issues and collection of health indices to help inform the community's move towards better health.

Methods:

A team of health care providers conducted a health fair at the Okwu-Emekuku PHC in Imo State, Nigeria. Glucometers and sphygmomanometers were used to collect basic physical health indices while the HAM-D depression scale was used to collect mental health indices.

Results:

The population reported the following averages: Fasting blood sugar (FBS) of 104.88 with an SD of 63.90, mean systolic blood pressure of 151.33 with an SD of 29.42, and mean diastolic blood pressure of 84.73 with an SD of 15.40. 43% of participants endorsed depression.

Significance:

The process of planning for the health fair, conducting needs assessment and providing feedback to the community leaders has been a learning experience about ways of conducting (business of) health care in the developing world.

Keywords: primary health care; health fair; sustainability of resources in developing world; community ownership; community engagement

Introduction:

Nigeria

Nigeria is a multi-ethnic, multi-cultural population. It is Africa's most populous country per CIA World fact book _ 2022 and as of 2020, the estimated population of Nigeria was over 206.14 million, ranking 7th in the world based on United Nations projections of its 2012 census statistics. Fifty percent of the people live in rural areas (Trading Economics/World Bank 2021) and life expectancy at birth is 55.2 years (WHO 2018). Despite its rank as the largest oil producing country in Africa and the eleventh in the world (US Energy Information Administration 2020), the numbers of people living in extreme poverty in Nigeria as of April 2019 was 91,501,377, making Nigeria the poverty capital of the world (National Bureau of Statistics, Nigeria). Six months later, that is, by November 2019, the

making Nigeria the poverty capital of the world (National Bureau of Statistics, Nigeria). Six months later, that is, by November 2019, the numbers jumped to 94,470,533 people in extreme poverty. This means that between April 2019, and November 2019, an additional 2,969,158 Nigerians joined the extreme poverty class. The discrepancy between the apparent wealth (raw material resources) of Nigeria and the poverty level in the country has been attributed to corruption and inept leadership (Ebegbulem 2012). Achievement of high and equitable coverage of integrated primary health-care services requires consistent political and financial commitment, incremental implementation based on local epidemiology, use of data to direct priorities, and assess progress, especially at district level, and effective linkages with communities and non-health sectors (Lawn et al 2008). A key component of achieving universal health coverage is ensuring that all populations have access to quality health care (GBD 2016 Healthcare Access and Quality Collaborators). The corruption and inept leadership which drive the socio-economic and political climate in Nigeria are responsible for the current health status of its citizens. GBD 2016 Healthcare Access and Quality Collaborators ranked Nigeria 142 out of 195 countries in its 2016 analysis of healthcare access and quality index based on data from 1990 to 2016. Nigeria has 36 states and 774 local government areas (LGAs). Health care provision for Nigerians is a responsibility of all three tiers of government, with federal government primarily responsible for tertiary health care, state government responsible for secondary care, and local government responsible for primary health care. Over the years, successive governments have not paid the desired attention to primary health care as a gateway to accessing health care delivery in the country (Welcome 2011). The allocation from the federal government to the local government areas is poor. The quality of health care services delivered is poor and remains a huge source of concern due to poor budgetary allocation (Aregbeshola 2019).

Umuakaliukwu Emekuku Community

Umuakaliukwu-Emekuku Community is one of the three autonomous communities that make up the town of Emekuku, in Owerri North Local Government area of Imo State, Nigeria. It is about 8 miles from Owerri, the Imo State capital, on the Owerri-Umuahia road axis. It has an estimated population of about 35,000 people, the majority of which are farmers and traders by occupation. The population is literate with most members having at least an elementary level education, and 50% with a high school education. Members under 15 years old constitute about 30% of the population, while those 60 years and above constitute about 25%.

While most Umuakaliukwu-Emekuku community members identify as Christians, the influence of ingrained Igbo traditional religion continues to be an important part of their culture, which affects some of their healthcare beliefs and practices.

The Umuakaliukwu Emekuku primary health center (PHC) is located within the geographical boundaries of Okwu-Emekuku and will henceforth be referred to as the PHC. It is the PHC for Umuocham, Umuakuru, Akalovo, Okwu, and Nkwo Emeke. The PHC, built entirely by the efforts of the women of Okwu-Emekuku and donated to the Owerri North Local Government, to serve, as a health center to the people, is the PHC serving the estimated thirty-five thousand (35,000) people living in Umuakaliukwu-Emekuku community. The idea of the PHC came to fruition because of

community members' interest in taking charge of their health and increasing access. Prior to establishing the community PHC, members traveled long distances for very basic health care. Women leaders rallied round, tasked themselves and held various fundraising events to complete the building. While the structure was under construction, the PHC used temporary locations to conduct its business. Following its completion and commissioning by the government, it was declared an Extended Program on Immunization (EPI) center, and houses vaccines which are maintained by solar powered equipment supplied by the World Health Organization (WHO). Yet, the rest of the healthcare center was in darkness and bereft of essential infrastructure during the initial needs' assessment conducted by the health fair fact-finding team in December 2015. The center had inadequate infrastructure to accomplish its purpose (please see appendix for the list of pressing needs as compiled by the PHC supervisor in December 2015).

Research has shown that the participation of a community in its health is not only cost-effective but also a very important means of allowing organization of political, social, and economic resources (MacCommack 1983). This would in turn allow for the success of the primary health care delivery system as well as the improvement in the health status of the community especially with the inadequacy of the government in Nigeria. Community participation in health allows communities develop problem solving skills, take responsibility for their health and welfare, ensure that the needs and problems of the community are adequately addressed, ensures that the strategies and methods used are culturally and socially appropriate or acceptable (Sule 2004). According to the National Consultative Team and the National Advisory Committee on Essential National Health Research, there are major difficulties in accessing scientific literature as well as publishing research findings in Nigeria. These difficulties are hindrances to the growth and development of the health care sector in Nigeria, of which the primary health center remains the most important means to achieve equitable access to health care delivery to the population.

The primary investigator/health fair coordinator although born in the US, was raised in Nigeria and considers Okwu Emekuku her ancestral home. This exercise stems from a desire to rally the community towards engagement and ownership of its health (all aspects including mental health) given the desire and willingness of the community to improve its health status shown by self-determination factors in getting its own PHC off the ground.

In this paper, we report the experience of conducting needs assessments in the community, conducting a health fair and report findings derived from retroactively assessing data collected during the fair, which was accessed via medical records of community residents and analyzed following the completion of the fair.

Our working hypothesis is that the partnership established between providers/investigators and community members will help the community take ownership of its health, create the force needed to source resources and encourage proper and adequate utilization of the PHC resources by community members.

2.0 Methodology:

Needs Assessment:

The initial needs assessment conducted in December 2015 involved a focus group discussion between the investigator, a community leader and the PHC supervisor at the PHC. There was

a tour of the facility to see what was on ground followed by a description of the day-to-day running of the center from the PHC supervisor.

The second needs assessment was conducted in June 2016 by the community leaders using an interview guide during a town hall meeting where the villagers reported an interest in having a health fair with a focus on screening, urgent care, and education.

Health Fair Planning:

The primary purpose of the health fair in December 2016 was to increase awareness among adult members of the community about common public health issues; hypertension, diabetes mellitus and depression by delivering appropriate information and answering questions within this context. Other goals of the exercise included screening of individuals for the above-named medical issues, urgent treatment/crisis intervention as needed, providing critical information about referrals and follow up care for those with positive screening results and collection of de-identified data to help inform the community about patterns of disease distribution in the community.

Meeting with traditional ruler:

The community leaders met with the traditional ruler (spiritual and moral leader of the community) for approval. On the day of the health fair, the team also met briefly with the traditional ruler prior to starting the exercise

Engaging the youth in providing security:

The community leaders engaged the *Okwu Vigilante* (security agency of the community) to provide security and ensure that the crowds were contained and that the participants observed rules and guidelines for the exercise

Engaging the leaders in disseminating information about health fair:

The community leaders including the women leaders disseminated the information to community members during their usual monthly/biweekly meetings and other gatherings starting September 2016

Engaging the health workers about materials:

The PHC health workers provided information about medications and instruments available in their inventory. The health fair team provided other materials such as sphygmomanometers, glucometers, stationaries, and HAM-D Depression scales needed to conduct the fair.

Catering:

Health fair participants received food prepared by a local caterer and paid for by the health fair team after collecting their fasting blood samples

Engaging the medical/nursing staff:

During the planning stage, it was difficult to engage the medical practitioner in charge of the PHC. It appeared that this provider barely visited the PHC per reports from community members and healthcare workers. However, the nursing staff was quite involved and engaged appropriately with the community members and health fair team

Formal Approval:

The State Government approved this health fair after review of the application. The traditional ruler of the community, women leaders, elders, and youth leaders approved the health fair and supported the exercise to make it a success.

Consent:

Health Fair participants were informed that the information and

health indices gathered from them will be used to help inform them about their collective health status. The community members who participated in the screening provided verbal consent to allow screening for the physical and mental health indices.

Meeting with community leaders, women leaders, youth leaders and health care workers afterwards

Series of meetings occurred between the health fair team and community members, leaders and health care workers allowing sharing of basic findings from the health fair as well as recommendations for social responsibility/accountability and establishment of a community health care task force.

Health Fair:

As soon as community members arrived, a member of the health fair team assigned them a number and gave them a signed document (Hamilton Depression Rating Scale, abbreviated as HAM-D) with their number on it for presentation to the health fair team during the screening process. After assignment of number 60, assignment of numbers ended, and sample size was noted as 60. The general education portion included education about common public health issues. About 100 people participated during this educational event. The screening portion of the health fair had enough resources for only 60 individuals and only the first 60 community members who arrived as verified through the assigned numbers participated during this portion. This ensured that the resources to conduct the health fair were enough.

The screening measures were blood pressure readings and glucometer readings by trained public health nurses; employees of Owerri North Local Government Area and other non-health care assistants all under the supervision of the Consultant Physician/Psychiatrist who was the primary investigator and who administered the Ham-D questionnaire.

By the end of the health fair, 60 participants had gone through various screening stations for blood pressure checks, blood sugar checks and depression screening with the signed HAM-D. Participants with high fasting blood sugar ($>200\text{mg/dl}$ on a repeat) and/or high blood pressure (systolic >200 or diastolic >120 on a repeat) received medications from the PHC (allocations from the government) as urgent/crisis intervention on site with re-checks of their readings after laying down at the PHC bed for 1-2 hours. Those with abnormal readings received counseling and referrals for follow up prior to going home.

The health fair team did not ask for any names or other identifying information from participants. Information collected during this exercise was de-identified to protect the confidentiality and privacy of the participants. There was no coercion to participate in the exercise. All participation was voluntary. There was no appreciable risk for community members who decided to participate in this exercise.

Screening Measures:

Blood pressure:

Volunteers and assistants administered BP checks using electronic blood pressure apparatus. The licensed public health nurses re-checked any high BP readings from the electronic methods through manual sphygmomanometer for more accurate readings.

Fasting Blood Sugar:

Only the licensed public health nurses administered glucometer readings. The fasting blood sugar (FBS) readings were in mg/dl .

HAM-D:

HAM-D is a simple screening tool utilized in primary care settings.

It is currently considered the golden standard for measuring depression in cross-cultural psychiatry (Vindbjerg, Makransky & Mortensen 2018), hence its use during this exercise. It is important to note that the Consultant Psychiatrist who administered the HAM-D speaks the native language of the community members and translated its content accordingly.

Sample and Analysis:

We performed data entry. Given a limited sample of only 60 respondents, data analysis involved all 60 respondents. Due to missing data from some of the questions on the HAM-D, we chose to drop all columns on the original HAM-D scale where the sum of the column values was below 25. This number was somewhat arbitrarily decided, but we generally chose a threshold that would delete columns that were clearly not going to be useful for correlation analysis, while keeping those with only a few responses, but still enough to warrant analysis. While this statistical analysis drops those features, the mere fact that some features are not quite common and others are, is worth analyzing in and of itself.

The next major part of analysis dealt with calculating correlations between features (Figure 1). We used the Pearson correlation co-

efficient. This method measures the linear correlation between any two features, or variables, and is on a scale of -1 to 1

Finally, we calculated medians and means of our features and calculated what percentage of the population suffered from any of the symptoms noted on the HAM-D, regardless of where on the scale they landed, so that we could see which symptoms were of utmost concern and most common for this population. For features where it was applicable, we also calculated standard deviation, to see how variable responses were for those features.

3.0 Results:

3.1 Results from Needs Assessment:

Essentially, the PHC supervisor reported that the biggest issue was lack of electricity as well as lack of basic amenities such as delivery beds to carry out its function.

3.2 Socio-demographics and General Health Practices:

Our mixed-methods approach revealed that most people who attended the 2016 PHC Health Fair were women (81.67%). The participant age was normally distributed as seen by Table 1, with the average age of 57 years old (56.58), with a standard deviation (SD) of 12.74.

Variables	Full Sample		Males		Females	
	% or mean	SD	% or mean	SD	% or mean	SD
Systolic	151.33	29.42	140.64	28.85	153.73	29.01
Diastolic	84.73	15.40	78.0	11.75	86.24	15.71
FBS	104.88	63.90	138.45	97.33	97.34	50.63
Age	56.58	12.74	57.45	11.57	56.39	12.98
PHC w/in last 12 mos	46.67%	-	54.55%	-	44.90%	-
BP w/in last 12 mos	65%	-	63.64%	-	65.31%	-
FBS w/in last 12 mos	36.67%	-	45.45%	-	34.69%	-
Depressed Mood	80%	-	90.91%	-	77.55%	-
Feelings of Guilt	26.67%	-	27.27%	-	26.53%	-
Insomnia (initial)	61.67%	-	54.55%	-	63.27%	-
Insomnia (middle)	71.67%	-	81.82%	-	69.39%	-
Insomnia (delayed)	70%	-	81.82%	-	67.35%	-
Work and Interests	36.67%	-	45.45%	-	34.69%	-
Agitation	38.33%	-	54.55%	-	34.69%	-
Anxiety (Psychic)	58.33%	-	63.64%	-	57.14%	-
Anxiety (Somatic)	43.33%	-	45.45%	-	42.86%	-
Paranoid Symptoms	38.33%	-	54.55%	-	34.69%	-

N	60	11 (18.33%)	49 (81.67%)
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Out of our total sample size (n=60), 46.67% of participants reported seeing a primary health-care physician (PHC) within the last 12 months, 65% of participants reported measuring their blood pressure within the last 12 months, whereas only 36.67% of participants have measured their FBS within the last 12 months.

3.3 Physical Health Indices:

As seen in Table 1, the mean systolic BP (140.64 with SD of 28.85) and diastolic BP (78.0 with SD of 11.75) of the male population were respectively below the mean for the total population (SBP of 151.33 with SD of 29.42/DBP of 84.73 with SD of 15.40). However, the mean fasting blood sugar (FBS) of the male population (138.45 with SD of 97.33) was above the mean for the

total population (104.88 with SD of 63.90)

The mean fasting blood sugar (FBS) of the study population was 104.88 with an SD of 63.90, which falls into the category of pre-diabetes according to the American Diabetes Association (ABA). The mean systolic blood pressure was 151.33 with an SD of 29.42, which is hypertensive stage 2 according to the American Heart Association (AHA). The mean diastolic blood pressure was 84.73 with an SD of 15.40, which is hypertensive stage 1 according to AHA. Hypertensive stage 2 was the most prominent blood pressure score across the board. Most of the participants had blood pressure scores above those of normal levels (86.67%), as seen in Table 2.

Blood Pressure Category	Systolic mm Hg (upper number)		Diastolic mm Hg (lower number)	Count in our study
Normal	Less than 120	and	Less than 80	8
Elevated	120-129	and	Less than 80	4
High Blood Pressure (Hypertension) Stage 1	130-139	or	80-89	10
High Blood Pressure (Hypertension) Stage 2	140 or higher	or	90 or higher	30
Hypertensive Crisis (consult your doctor immediately)	Higher than 180	and/or	Higher than 120	8
Diabetic Category	Fasting Plasma Glucose (FPG)			Count in our study
Normal	Less than 100 mg/dl			46
Prediabetes	100 mg/dl to 125 mg/dl			9
Diabetes	126 mg/dl or higher			5
Depression Category	HAM-D Score Range			Count in our study
Normal	0-7			34
Mild Depression	8-13			14
Moderate Depression	14-18			5
Severe Depression	19-22			1
Very Severe Depression	>22			6

Most participants of the study population displayed non-diabetic blood sugar (76.67%), but 23.33% of participants displayed either prediabetes or diabetes, as depicted in Table 2. 15% of participants had pre-diabetes while 8% had diabetes.

3.4 Mental Health Indices:

Based on Table 1, 80% of the sample reported depressed mood, over 60% reported some form of insomnia and almost 40%

reported paranoia. About 50% of the participants reported anxiety symptoms. Even though males made up less than 20% of the sample population, they appeared to report above average scores in the symptoms mentioned above.

Based on the HAM-D scale results, 56.67% of the sample scored in the normal range, 23.3% of participants reported mild depression, 8.33% of participants reported moderate depression,

1.67% of participants reported severe depression, and 10% of participants reported very severe depression, as displayed in Table 2.

3.5 Associations between Physical and Mental Health Indices:

Somatic and psychological symptoms showed various associations. Figure 1 presents a statistically significant correlation between psychic and somatic anxiety symptoms, with a correlation of 0.717. This association signifies the relationship between psychic symptoms, such as feelings of tension and irritability, with somatic symptoms like gastrointestinal and cardiovascular symptoms. There is a positive correlation between somatic anxiety symptoms and feelings of guilt. This association signifies the relationship between somatic symptoms, such as gastrointestinal

upset with feelings of guilt due to life stressors. There are statistically significant correlations between work and interests with the overall level of depression. This is also the case for psychic anxiety's relationship to overall level of depression. There are statistically significant correlations between insomnia initial, middle, and delayed, signifying a relationship between the progressive forms of insomnia. Also elicited were statistically significant correlation between feelings of guilt and work and interests, psychic, and somatic anxiety, as well as the overall depression level.

There was a statistically significant correlation between FBS and the decline in interest and productivity in work and interests.

Figure 1

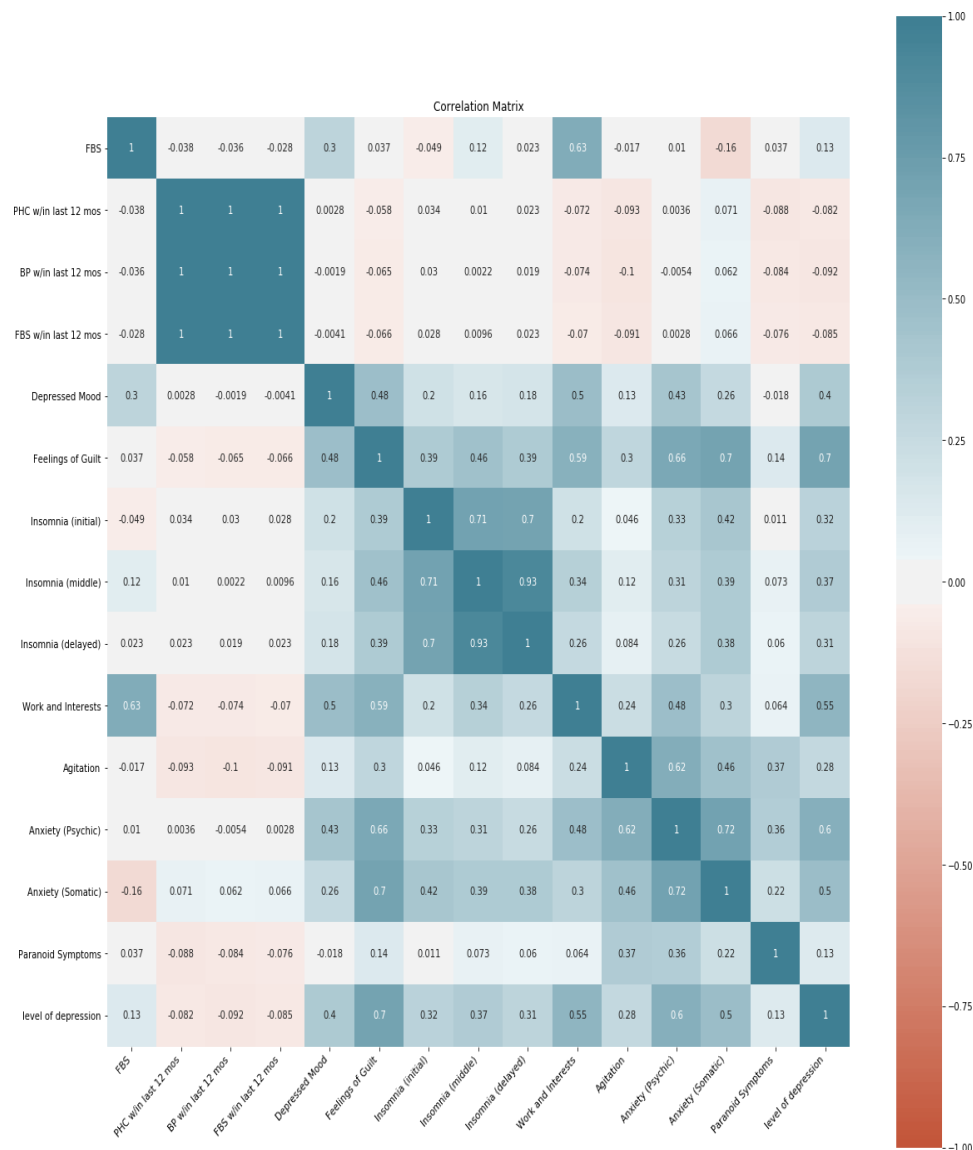


Figure 2:

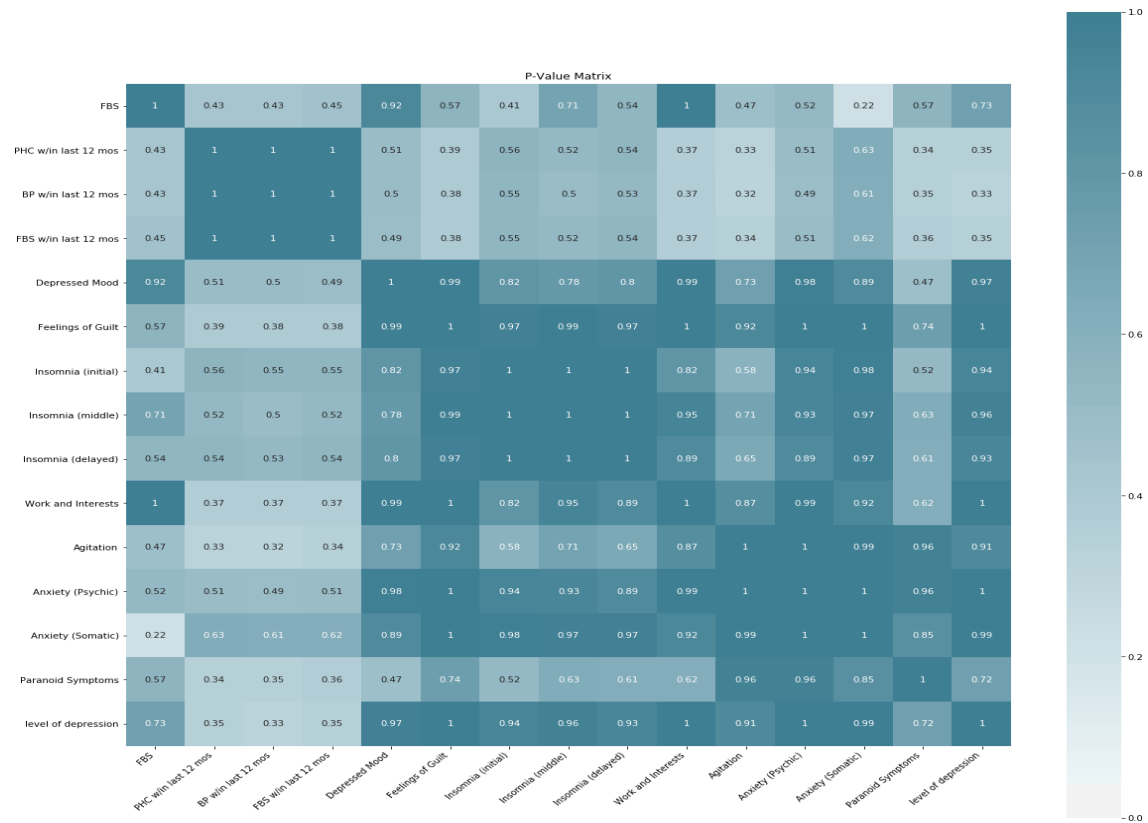
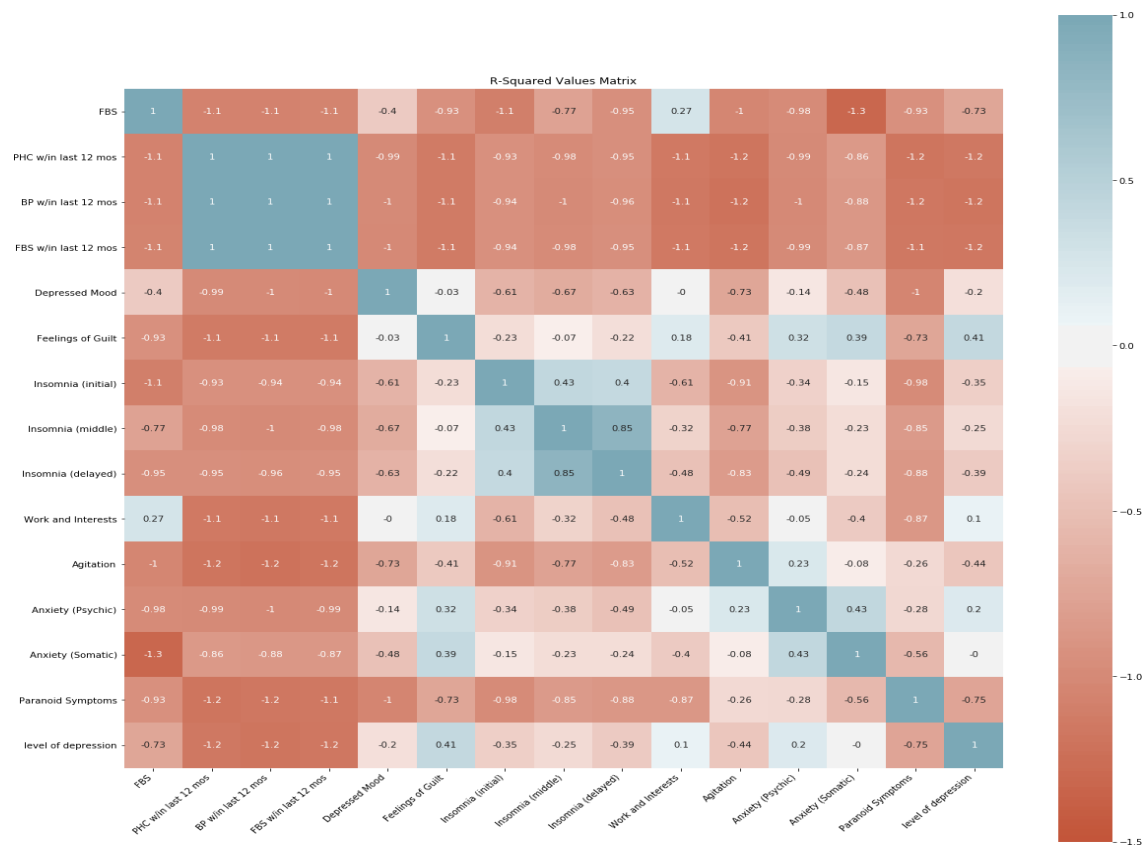


Figure 3:



4.0 Discussion:

Our data suggests that the study population has less than average health status with Hypertensive stage 2 as the most prominent blood pressure score across the board. Most of the participants had blood pressure scores above those of normal levels (86.67%). 23.33% of participants displayed either prediabetes or diabetes (15% of participants had pre-diabetes while 8% had diabetes). The dearth of literature in African populations limits comparisons. However, a recent study in a rural Ghanaian community from Mphekgwana et al 2021 notes a 28% diabetic rate as opposed to 8% in this study while Kunutsor and Powels 2009 in Rural Remote Health note lower systolic and diastolic blood pressure averages when compared to this study. There are concerns for environmental risk factors as well as gene-environmental interactions. Some of the participants arrived with FBS in diabetic range and yet, did not present as overly concerned. Some participants had mean systolic and diastolic blood pressure scores in the hypertensive stage and appeared unperturbed. These are concerning issues because they call to question the level of health awareness in the area as well as the operative health beliefs in the community. About 43% of participants endorsed some level of depression. Our findings are quite novel in the area, especially the mental health findings. The strong correlations between depression levels and somatic and psychic symptoms are a benefit to the literature, especially with the tendency for African communities to eschew any acknowledgment of depressive symptoms. Mental health awareness is essentially non-existent in the area, especially in such a rural community. The HAM-D scale provided a unique aspect to the health fair, thus assessing health more holistically. We found some interesting correlations between feelings of guilt and somatic symptoms, as well as with depression levels, which are critical findings. Not only are people reporting feelings of guilt, depression, and stress, they are reporting physical symptoms due to those psychological symptoms. This evaluation brings a unique perspective to health for the participants, as mental health is not culturally significant for the area at the current time due to stigma. To draw any definite conclusions, it is important to carry out more defined research and investigations into these health issues. It is important to note that we cannot speak of causation with these associations, for correlation does not equal causation. There is a need for more large-scale health fairs and research to draw better conclusions. However, it is of utmost importance that these preliminary findings from the health fair become a part of the literature for reference as well as a wake-up call for more extensive survey of the health status of the community to inform practical ways to bring about transformational change in health beliefs and practices. Overall, the data suggests that there may be underlying issues in the participants that make them more vulnerable to health issues pertaining to blood sugar and blood pressure. We also suspect that there may be a link between feelings of guilt and stress to somatic symptoms.

As Nigerian Americans, the health fair team had the task of gaining the trust of the residents to execute this health fair. Those who felt comfortable enough to attend participated. The health fair allowed us to engage with the villagers as part of a community-based participatory research study. Assessing mental health status using the HAM-D depression scale called for a certain level of comfort. Implementing health fairs in this village allowed us to overcome cultural barriers to employ physiological and psychological

screening.

Our data suggested that there are health problems that warrant the attention of the people. Hence a post-fair meeting was held, and the community was provided with the essential findings as reported here. One of the primary goals of this health fair was to create a pilot that would serve as a template for helping community members embrace their health and take responsibility for their health with some of the medical model ideologies in place. Some of the key factors for achieving this goal included involving community members in the health field to help interpret these findings and their meanings as well as establishing the Okwu PHC Task Force run by community members to manage the affairs of the PHC and by extension, community health. It was pivotal that the community take its health seriously and begin to incorporate some medical models as an explanation for its health problems. It was quite challenging but necessary to modify what already exists in the community. The effectiveness of the health fair and its impact were asserted without uprooting the community from their familial practices. The Okwu PHC Task Force assigned various roles to members to ensure accountability, monitors the movement of pharmaceutical drugs in and out of the PHC, ensures accountability of staff assigned to the PHC and maintains engagement with the local government body responsible for the PHC. In other words, the community has taken responsibility for the clinic they built.

4.1 Limitations:

Whilst we did discover interesting and useful findings through our study, we recognized its weaknesses. In terms of data collection, it is quite possible that the news of the health fair will not have reached all residents of the community. Since we were relying on news spreading from the community leaders of the village, there may be residents out of the social sphere. In respect to ableism, the fair was approximately eight hours long, which could have prevented certain participants from withstanding the duration. Also of importance is the fact that the 60 who were screened were the first to arrive at the fair and might be anxious individuals hence influencing their physical and mental health indices.

There were concerns that while some questions on the HAM-D were relatively consistent like “depressed mood” or “feelings of guilt”, some questions rarely if ever got affirmatively answered like “suicide,” “genital symptoms,” “diurnal variation,” “depersonalization and derealization”, indicating that different factors not on the HAM-D might be more indicative of depressive symptoms and feelings in this population. Considering that limitation, we feel that given the lack of alternatives, the HAM-D was sufficient for our purposes, but that we might want to alter it for future studies. Even though HAM-D is a simple screening tool utilized in primary care settings, there has not been any standardization in the primary language of the health fair participants so this might have introduced some bias.

About collecting demographic information, we failed to consider potential confounders such as marital status, socioeconomic status, religion, education level and income, which could have affected the reports of the participants. Future studies will include such critical data as we conduct larger-scale health fairs.

It was difficult to draw definitive conclusions from only 60 data points, and more responses might reveal correlations between features not demonstrated in our small sample or reveal that some

correlations made in this study do not hold up in greater samples. However, despite these limitations, the data collected in this study is relevant in understanding common medical issues and areas to focus future interventions on.

5.0 Conclusion:

The level of engagement within the community and the partnership forged with community members are critical factors in accomplishing the goal of transforming the mindset of the community about their approach to their own health. It is important to instill a passion for health awareness in the community to implement change. A key point is presentation of data collected and making connections between findings and current health struggles then allowing community members to make inferences about what may be driving their current conditions. Cultural competency is crucial for developing a sustainable program. Sustainability of health of the community can only happen when the community takes agency for itself and its members. Ownership is crucial for the community to maintain to become more sustainable. Adequate and frequent follow up meetings within the community is essential and allows for effective change within the community. As mentioned before, this health fair team encouraged the creation of a PHC Task Force within the community to ensure that the community has social responsibility and accountability for their PHC to ensure improvement and sustenance of the community's health status. Town Hall meetings between community leaders and residents are encouraged to keep all stakeholders informed about community health needs/PHC needs and sourcing resources from individuals as well as private and public agencies. Major improvements in community health are more likely to occur due to individuals' actions towards their health rather than what doctors are doing (Health Affairs 2013). As research has shown, community participation as a process of taking ownership of the health of community members is a complex process that involves context, culture, politics, economics, and social concerns of the community (Rifkin 2018). The key to implementing change in this community lies in the capacity of this community to take real ownership of its health and embrace ways to assert social responsibility and accountability of its PHC resources for sustainability of the health of its people.

Acknowledgement:

This paper is dedicated to all the members of the health fair planning committee made up of community leaders and members, who worked tirelessly to make this a reality and who now work tirelessly as the Okwu PHC Task Force to ensure that the community takes responsibility for the health of its members and holds others including the government and health workers accountable in managing the meagre resources available. The Task Force continues to consider its options in improving the health of its members by ensuring that members remain engaged and open to the process of changing mindset about health as well as embracing findings from empirical sources. The authors are grateful to Howard Moss MD and Funmi Akindejoye MPH who reviewed our work.

Author Contribution:

All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by [Ijeoma Ijeaku], [Ola Egu] and [Caroline Brown]. The final

draft of the manuscript was written by [Ijeoma Ijeaku] and all authors commented on previous versions of the manuscript. All authors read and approved of the final manuscript.

Conflict of Interest Statement:

The authors declare that they have no conflict of interest.

References:

1. Adewole I. (2016): Thirty-Six States and the FCT are to Share \$1.5m FG Fund for Primary Health Care. (2016).
2. Aregbeshola, B. (2019): Health care in Nigeria: Challenges and recommendations.
3. Aregbeshola, B.S. & Khan, S.M. (2017): Primary Health Care in Nigeria: 24 Years after Olikoye Ransome-Kuti's Leadership *Frontiers in Public Health*
4. Central Intelligence Agency: World Fact Book: Africa: Nigeria.
5. Chinawa JM (2015). Factors militating against effective implementation of primary health care (PHC) system in Nigeria. *Ann Trop Med Public Health*
6. Declaration of Alma-Ata: International Conference on Primary Health Care, Alma-Ata, USSR, 6-12 September 1978.
7. Ebegbulem JC. Corruption and Leadership Crisis in Africa: Nigeria in Focus. *International Journal of Business and Social Science* Vol. 3 No. 11; June 2012.
8. Encyclopedia Britannica: Nigeria retrieved on 01/19/20.
9. GBD 2016 Healthcare Access and Quality Collaborators. Measuring performance on the Healthcare Access and Quality Index for 195 countries and territories and selected subnational locations: a systematic analysis from the Global Burden of Disease Study 2016. *Lancet*. 2018 Jun 2;391(10136):2236-2271. Epub 2018 Jun 1. PMID: 29893224; PMCID: PMC5986687.
10. "Jupyter Notebook." *JupyterHub*,
11. Lawn JE, Rohde J, Rifkin S, Were M, Paul VK, Chopra M. Alma-Ata 30 years on: revolutionary, relevant, and time to revitalise. *Lancet*. 2008 Sep 13;372(9642):917-27. PMID.
12. National Consultative Team and the National Advisory Committee on Essential National Health Research; Health Research in Nigeria- a Summary.
13. Olawale, S. (2018): History of Primary Health Care in Nigeria.
14. "R-Squared Intuition (Article)." *Khan Academy*, Khan Academy.
15. Rifkin SB. Alma Ata after 40 years: Primary Health Care and Health for All—from consensus to complexity. *BMJ Global Health* 2018;3:e001188
16. Ritgak Tilley-Gyado, Oyebanji Filani, Imran Morhason-Bello & Isaac F. Adewole (2016): Strengthening the Primary Care Delivery System: A Catalytic Investment Toward Achieving Universal Health Coverage in Nigeria *Health Systems & Reform*
17. Trading Economics (World Bank 2021):
18. US Energy Information Administration: Country Analysis Executive Summary: Nigeria (2020).
19. Vindbjerg E., Makransky G., Mortensen E. L., Carlsson J. (2018): Cross-Cultural Psychometric Properties of the Hamilton Depression Rating Scale
20. Welcome MO (2011). The Nigerian health care system: need

for integrating adequate medical intelligence and surveillance systems. *J Pharm Bioallied Sci*

21. World Population Review: Nigeria Population 2020; retrieved on 02/04/20.
22. World Health Rankings: Nigeria; retrieved on 02/04/20.
23. "Health Policy Brief: Patient Engagement," *Health Affairs*, February 14, 2013.
24. Kunutsor S, Powles J. Descriptive epidemiology of blood pressure in a rural adult population in Northern Ghana. *Rural Remote Health*. 2009 Apr-Jun;9(2):1095. Epub 2009 Jun 5. PMID: 19508111.
25. Mphekgwana, P. M., Mabila, L. N., & Maimela, E. (2021). Indirect and direct effects of factors associated with diabetes amongst the rural black population in the Dikgale Health and Demographic Surveillance System, South Africa. *African journal of primary health care & family medicine*, 13(1), e1–e6.
26. Sule SS. Community participation in health and development. *Niger J Med*. 2004 Jul-Sep;13(3):276-81. Erratum in: *Niger J Med*. 2005 Oct-Dec;14(4):460. PMID: 15532232.
27. MacCormack CP. Community participation in primary health care. *Trop Doct*. 1983 Apr;13(2):51-4. PMID: 6679395.

Appendices:

Map of Nigeria showing Owerri in the south east area of Nigeria. Umuakaliukwu Primary Health-Care Center (PHC) is located in Okwu-Emekuku which is in the northern part of Owerri



Map of Imo State showing the local government areas. Okwu Emekuku PHC is located in Owerri North Local Government Area of Imo state



**UMUAKALIUKWU HEALTH CENTRE EMEKUKU
OWERRI NORTH LOCAL GOVERNMENT AREA
ORIE URATTA**

Our Ref: Your Ref:..... Date: 31st Dec. 2015

TO WHOM IT MAY CONCERN

THE PRESSING NEEDS IN OUR HEALTH CENTRE

The following preliminary items are needed in our health centre at Okwu-Emekuku Health Centre for our maximum service delivery to our local people in Umuakaliukwu.

1.	Weighing scale for children	15,000
2.	4 Drug cupboards	10,000 each
3.	6 drip stands	5,000 each
4.	4 Trolley	8,000 each
5.	4 Stainless dust bin	5,000 each
6.	2 Couch	20,000 each
7.	Screen	15,000 each
8.	Forceps (different types of scissors)	10,000
9.	4 Baby cot	30,000 each
10.	3 beds (6 springs) at 5,000 each	15,000
11.	2 Standing fan	20,000 each
12.	4 Fetal heart check	2,000
13.	5 BP Apparatus (sphygmomanometer)	5,000 each
14.	5 Sugar level checker (Glucometer)	5,000 each
15.	1 Computer generalized body checker	50,000
16.	10 Different types of thermometer	5,000 each
17.	6 Head pans	1,500 each
18.	Oxygen	
19.	Suctioning machine	12,000
20.	Cottons for windows and doors	20,000

It is also expected that electricity be provided in the centre in addition to these. The cost is estimated at about N50,000

Signed:

Igwe, Ijeoma C.
FOCAL Supervisor for the Centre