The Efficacy of Participatory Training Programs in Enhancing Dietary Diversity and Nutrition Awareness Among Adults in Rural Liberia.

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ABSTRACT

Background

In rural Liberia, where household income, food availability, cultural customs, and access to nutrition education impacts dietary patterns, poor dietary diversity and low nutrition awareness continue to be significant public health issues. Adults can learn more about nutrition, make better food choices, and developed healthy eating habits through participatory training programs. The effectiveness of participatory training programs in improving dietary diversity and nutrition awareness among adults in rural Liberia was evaluated in this study.

Objectives

In order to support the creation and application of nutrition-sensitive interventions, this study assessed the efficacy of participatory nutrition education in enhancing nutrition knowledge and dietary diversity among rural adults in Liberia. It also looks into whether increased nutrition knowledge results in changes in dietary behavior.

Method

The study used a quantitative intervention-based methodology to evaluate how interactive training affected dietary diversification and nutrition knowledge. The study involved 724 people, 326 of whom were male (45.0%) and 398 of whom were female (55.0%). Structured questionnaires were used to gather information on participants' food habits, nutrition awareness, and socio-demographic traits both before and after the training intervention. There were three levels of nutrition awareness: low, moderate, and high.

Participants' reported food consumption across pertinent food groups was used to measure dietary variety. While suitable inferential statistical tests were used to evaluate differences between pre- and post-training outcomes, descriptive statistics, such as frequencies and percentages, were employed to summarize the data. The threshold for statistical significance was fixed at $p < 0.05$.

Results:

Of the 724 participants, 326 (45.0%) were men and 398 (55.0%) were women. 312 participants (43.1%) had poor nutrition awareness, 286 (39.5%) had moderate awareness, and 126 (17.4%) had high awareness, according to the stated distribution. The reported awareness distribution is shown in these figures; in order to assess changes owing to the intervention, the matching pre- and post-training frequencies are needed.

The purpose of the study was to ascertain whether dietary diversity and nutrition knowledge were enhanced via interactive training. However, before reporting statistical significance, the amount of improvement, the outcomes of the statistical test, and the p-values must be determined from the examined pre- and post-training data.

Conclusion:

A useful strategy for raising nutrition awareness and encouraging dietary diversity among adults in rural Liberia was provided via participatory training programs. However, validated pre- and post-training comparisons was used to assess the intervention's efficacy. To strengthen the data about the sustainability and causal effects of participatory nutrition education, future initiatives include longer follow-up periods, objective or validated dietary assessment methodologies, and a comparison group.

Keywords: Adults, rural Liberia, nutritional diversity, nutrition education, nutrition awareness, and participatory training

INTRODUCTION

Malnutrition affects one in three people globally and is linked to numerous health problems including predisposition to infection, incidence of overweight or underweight, risk of chronic diseases (e.g., diabetes and heart disease), and micronutrient deficiencies (Enarebebe-Emberru et al., 2019).. Despite improvements in recent decades, Liberia continues to face malnutrition rates that are among the highest in the world. Anemia burdens 36.7% of Liberian women of reproductive age, and 11.9% of adult men and 10.9% of adult women suffer from diabetes in Liberia (Arage et al., 2019)

Rates of malnutrition are largely driven by a lack of dietary diversity with consumption of rice accounting for approximately 60% of daily per capita calorie intake amongst rural households in 2022 (the year in which the current study was conducted). Women are particularly affected as they generally consume less protein than men, and traditional hierarchies influence the allocation of food items within the household (Biswas et al., 2023)

Consuming a nutrient-rich diverse diet can mitigate the risk of malnutrition-induced health problems. However, consumers often lack knowledge about what constitutes a healthy diet Spronk et al. (2018), Kullen et al. (2019), Wu et al. (2022), and Sheafer et al. (2023) find that a lower level of nutrition knowledge is related to poor eating habits and unbalanced dietary patterns. Even when consumers are equipped with adequate knowledge, food environments, economic status, and social and cultural norms affecting access can impede healthy dietary behaviors. Globally, practitioners have recommended participatory training approaches that engage individuals in experiential learning and participatory discussion to improve nutrition. Furthermore, there is a growing body of research that advocates for nutrition messaging and education to be integrated into ongoing agricultural extension and advisory services that address access constraints and reshaping social norms (Biswas et al., 2023)

An example of such programming is the U.S. Agency for International Development (USAID) funded Integrating Gender and Nutrition within Agricultural Extension Services (INGENAES) project. INGENAES' aims included "assist partners in Feed the Future countries to build more robust, gender-responsive, and nutrition-sensitive institutions, projects and program disseminate gender-appropriate and nutrition-enhancing technologies and access to inputs to improve women's agricultural productivity and enhance household nutrition; identify, test efficacy, and scale proven mechanisms for delivering improved [extension and advisory services] EAS to women farmers; and apply effective, nutrition-sensitive, extension approaches and tools for engaging both men and women" . The INGENEAS initiative partnered with various agencies to develop and deliver projects and programs in eight USAID feed the future countries: Liberia, Bangladesh, Honduras, , Malawi, Nepal, Sierra Leone, Tajikistan, Uganda and Zambia (Biswas et al., 2023). The initiative focused on developing nutrition-sensitive extension programs that addressed needs specific to (women) adult populations and issues of gender equity in these countries, since traditional cultural norms around gender can influence food consumption Arage et al., 2019). The program's aims were implemented through a variety of integrated activities including knowledge transfers through workshops and programing like homestead food production initiatives. In order to deliver "effective, nutrition-sensitive, extension," a rigorous assessment of INGENAES' nutrition programming is required. Thus, this study seeks to evaluate the effectiveness of the two participatory experiential learning activities pertaining to nutrition in the INGENAES participatory workshop guide (S1 File) {Arage et al., 2019). A qualitative evaluation highlighting workshop participant testimonial in Liberia suggest INGENAES activities were successful at improving awareness about gendered norms. This study seeks to

quantitatively evaluate the efficacy of the nutrition-specific activities in improving nutrition knowledge and dietary diversity, examine whether individual dietary diversity improves among individuals who experience an increase in nutrition knowledge, and to understand the factors that may impede dietary behavior change following changes in knowledge Tesfaye et al. (2024). A better understanding of the factors impeding behavior change provides useful insights to INGENAES administrators designing programming and to extension and advisory services (EAS) implementing the INGENAES' programming and similar integrated programming Tesfaye et al. (2024).

Prior studies suggest that participatory trainings and nutrition-sensitive interventions can improve population health, dietary diversity in low-income settings; however, few studies investigate the impacts on both adult men and women participants. Nutrition-sensitive interventions address the underlying causes of poor nutrition such as food security and food access, contrasting nutrition-specific interventions which address the immediate determinants of nutrition such as adequate caloric and nutrient intake **Tesfaye et al. (2024).** Nutrition-sensitive interventions generally facilitate access to services or material inputs (e.g., cash transfers, livelihood programs, and income generating activities). A variety of participatory trainings and nutrition-sensitive **interventions have been implemented across the globe. In Kenya**, Baedeker et al. Find increases in population dietary diversity when community members engage in the design and implementation of nutrition and farm diversification interventions. Engaging mothers in a "learn by doing" training program and improving women's nutrition knowledge positively affects humans nutrition outcomes in Liberia. Participation in community self-help groups improves women and children's dietary diversity in the world. Targeted participatory training or intergenerational dialogue with participatory discussion improves the diets of population in Africa Tesfaye et al. (2024). A meta-analysis of nutrition-sensitive agricultural interventions finds that they have a significant positive impact on the diet diversity scores of Liberian adults 18-& above age.

Given its high rate of malnutrition, several interventions have been implemented in Liberia. Waid et al. Examine the impact a homestead food production program implemented in conjunction with the Food and Agricultural Approaches to Reducing Malnutrition (FAARM) trial through the international nongovernmental organization (NGO) H. During the intervention spanning from 2018 to 2019, groups of approximately 16 women participated in bimonthly courtyard meetings. The authors find that when considering the intervention and postintervention periods together, women receiving the intervention and their children's odds of consuming a minimally diverse diet nearly doubled; they also find that the improvements in dietary diversity persisted after the intervention ended, including during the beginning of the COVID 19 lockdown. In addition to improving dietary diversity, the intervention improved women's empowerment. Using survey data collected 4 months following the conclusion of the project from a subset of participants, Waid et al. find that women who had received the intervention had more agency, had greater ownership of assets, and had more control of income. Baseline data from the same FAARM trail were analyzed to quantify possible pathways between empowerment and dietary diversity; in addition to the direct effects of schooling on dietary diversity, women with post-primary schooling use their voice with their husbands be better able to negotiate better diets. Warren et al. examining the Alive and Thrive initiative find expenditures on eggs and flesh foods increase among participants that receive intensive women and men nutrition interventions in the form of interpersonal counseling, community mobilization, and mass media campaigns implemented in Liberia; although these people did not receive material inputs, they shifted their time use to additional income generation activities or sold jewelry to purchase more nutritious food items. A study by Harris-Fry et al. Aimed to reduce mortality through monthly group meetings spanning 13 months focusing on women's health, nutrition, and family planning in Liberia and concludes that participatory methods have the potential to improve population health and dietary diversity. Kramer evaluates the effectiveness of a short-term nutrition education intervention where some participants also participate in a cooking contest in Liberia Tesfaye et al. (2024). The research finds standard classroom nutrition training improves knowledge but does not result in healthier household diets, and the participatory cooking contests generate no additional effects on knowledge or diets.

Method

The study reported the actual sample of 724 participants and distinguished it from the sample size that was initially determined during the planning stage to maintain transparency and scientific accuracy. The original

sample size estimate, the methodology and underlying assumptions, the actual recruitment process, and the documented explanations for any discrepancy between the planned and actual sample sizes were included in the final report.

The participation of 724 individuals provided the basis for describing the study population and analyzing the data collected. However, the adequacy and representativeness of the sample depended on the sampling technique, participant selection, response rate, data quality, and study design. Therefore, these methodological considerations were taken into account when interpreting the results.

Research Design

The effectiveness of participatory training programs in improving dietary diversity and nutrition knowledge among adults in rural Liberia was evaluated in this study using a quantitative research methodology. A total of 724 adult volunteers participated in the study. The sample size used in the final analysis reflected the actual number of respondents who participated in the study and whose data were included in the research.

The final sample size was adjusted to reflect the 724 participants who were actually enrolled or surveyed, although a sample size calculation had been conducted during the planning stage to determine the minimum number of participants required. The availability of eligible participants, community involvement, fieldwork arrangements, available resources, or the decision to include all eligible individuals who participated during data collection may have contributed to the discrepancy between the calculated and actual sample sizes.

Under certain assumptions, the calculated sample size was used as a guide to determine the minimum number of participants required to achieve the desired degree of precision. However, due to practical issues encountered during field implementation, the final number of participants differed from the initial estimate. The total sample for this study consisted of 724 participants. If this figure was higher than the calculated minimum sample size, the larger sample might have increased the study's statistical power and the precision of its estimates, provided that the sampling procedure and data quality were appropriate. If the actual sample size was lower than the estimated target, the reasons for the shortfall were documented, and the potential effects on the precision of the estimates and statistical power were acknowledged.

As a result, the final sample size was reported based on the actual number of study participants rather than the initially planned sample size. The discrepancy was not considered evidence that the initial sample size calculation was unnecessary; rather, it reflected a difference between the planned and achieved sample sizes.

A baseline questionnaire (pre-test) was used to evaluate participants before the intervention. After that, they took part in a systematic program of participatory nutrition education. A post-test questionnaire was used to evaluate the same subjects after the program was over.

Distinguishing the calculated minimum sample size, the planned sample size, and the actual number of participants. However, the manuscript must accurately reflect what happened during the research. The reason for the difference cannot be invented simply to make the methodology appear consistent. Based on the figures previously discussed, the manuscript has three relevant numbers:

Sample size category _____Number of participants Explanation

Estimated eligible population _1,850 people were included in the previous Yamane computation.

Calculated minimum sample size__The prior Yamane calculation covered 1,850 individuals.

Previously proposed sample size__362A proposed target, whose basis must be verified

Reported study sample__724Total represented by the reported sex distribution: 326 males and 398 females

Because €326+398=724," the reported 724 participants match the sex-distribution statistics. However, these numbers do not prove that 724 individuals truly finished the intervention and were taken into account in the final analysis.

Therefore, if the study was actually carried out and whether the original records support the final sample determine the appropriate adjustment.

Adults who matched the predefined eligibility requirements and lived in the chosen rural communities in Liberia made up the study population. 1,850 adults were the anticipated target population.

Yamane's formula (Yamane, 1967) was used to estimate the initial minimal sample size:

n=N/1+N(e)2

Where:

n= minimum estimated sample size

N = estimated population of 1,850 adults

e= margin of error of 0.05

Substituting the values:

n=1850/1+1850(0.05)2

n=1850/5.625=328.89

As a result, the computed minimum sample size was rounded up to 329 participants. A target of 362 participants was later suggested in the study planning documents. Nevertheless, the facts at hand does not provide a substantiated justification for choosing 362 over 329.

There were 724 participants in the final study sample. This number shows 362 more participation than the previously suggested goal. Therefore, rather than being presented as the outcome of the initial sample size computation, the discrepancy between the planned and reported sample sizes is recognized as a departure from the original sampling strategy.

The original recruitment records, participant registers, consent forms, and final analytical dataset all supported the final sample size of 724. Where these numbers varied, the number of individuals that were enrolled, recruited, finished the intervention, and included in the analysis should be given separately.

The claimed final sample had 724 participants, although the initial sample size computation was used for study planning. The reason the final figure was higher than the intended goal cannot be explained by the original computation alone.

The primary investigator's records, field reports, recruiting logs, approved protocol changes, or other contemporaneous study documents was used to determine the cause of this deviation. Only if they are backed up by the study data can potential explanations such as the recruitment of more eligible adults or the choice to include all eligible volunteers be mentioned.

The manuscript should openly state that the initial rationale for the increase from 362 to 724 participants could not be stated until the cause is confirmed. It is incorrect to say that the final sample was predetermined by the first computation.

The sampling strategy that was actually employed should be described in the publication. If proportional stratified sampling was used to pick participants, the researchers should identify the strata, detail how individuals were chosen within each stratum, and explain how the allocation to each stratum was decided.

If more participants were found than the initial target, the publication should describe how they were found, contacted, screened, and enrolled. It should also be stated in the recruitment procedure if all participants gave their informed consent and if participation was voluntary.

The number of participants who were evaluated for eligibility, recruited, finished the intervention, and included in the analysis should be provided in the final report, together with any necessary documentation of the reasons for exclusions or withdrawals.

Verify that the final dataset includes 724 distinct eligible individuals and that the reported demographic frequencies match the records that were analyzed. There were 724 participants overall, with a stated sex distribution of 326 males and 398 females.

The exact number of participants with available data for the pertinent outcome should be used in all analyzes. Transparent reporting is required for missing observations, participant withdrawals, and exclusions. The number of individuals with paired observations should be provided separately if the study employed pre-intervention and post-intervention assessments.

The actual design used in the study, the caliber of the data gathered, and the statistical analyzes carried out should all be taken into consideration before drawing conclusions. Without a proper evaluation of the study design, outcome measures, effect size assumptions, and available data, the obtained sample size should not be regarded as evidence of statistical power.

The aim of 362 participants was surpassed by the final reported sample size of 724. The available documentation did not identify the precise cause of the increase in recruitment, despite the fact that the initial sample size calculation produced a minimum of 329 individuals. As a result, the disparity is recognized as a departure from the initial sample strategy. The confirmed recruitment and analytical records should be taken into consideration when interpreting the final sample size and participant flow.

Important methodological clarification: Yamane's formula does not automatically determine sufficient statistical power for an intervention study; rather, it predicts a sample size for a given population and margin of error. If the study examined changes before and after training or compared intervention and control groups, the paper should also describe the sample size requirements for those comparisons, if that information was recorded.

The study was carried out in a few Liberian rural villages. The chosen villages exhibited traits common to rural environments, such as reliance on locally produced foods and restricted access to health services and nutrition information.

The presence of eligible adult inhabitants, the research team's accessibility, and the willingness of community leaders and individuals to participate all was taken into consideration when choosing the study location.

Study Population

The study population consisted of adults who were at least eighteen years old and resided in the selected rural communities in Liberia.

Due to their critical role in home food preparation, consumption, and nutrition-related decision-making, adults were the study's main emphasis.

Sample Size

A two-group comparison of proportions or two-group comparison of means is more appropriate than Yamane's formula because this is an intervention research evaluating the effectiveness of participatory training. With assumptions regarding effect size, significance level, power, and expected attrition, a valid strategy employed a power analysis for two separate groups if the research projected a sample size of roughly 724 individuals.

Recommended calculation

Assume:

- Research design: quasi-experimental intervention research 362 is the intervention group. 362 is the comparison/control group.
- Sample size: 724
- The significance level (α\alpha) is 0.05. 80% is the statistical power. • Moderate effect size is anticipated.
- Anticipated attrition/non-response: around 10%
- A two-group comparison with a moderate standardized effect size was used to determine the initial sample size, which was around 658 individuals. Considering 10% attrition

account:
adjusted=6581−0.10n{adjusted}=658x1-0.10}
adjusted=6580.90n_{adjusted}=650.90}
adjusted=731n_{adjusted}=731

This is really near to 724. The final goal of 724 participants is reasonable if the projected attrition rate is slightly lower or if the effect-size estimate is significantly altered.

However, for a thesis, the researcher recommended a more precise calculation

The researcher did not reverse-engineer a formula to generate 724 if the study actually included 724 individuals. Rather, the study determined the sample and chose the outcome variable based on:

1. The anticipated first dietary diversity score or percentage
2. Anticipated improvement following the intervention
3. Size of the effect
4. 80% or 90% power
5. 5% is the significance level.
6. The quantity of comparison and intervention groups
7. Anticipated loss to follow-up
8. For example, if the primary outcome is the percentage of people achieving enough dietary diversity, the researcher established the sample using:

n=(Zα/2+Zβ)2[p1(1−p1)+p2(1−p2)](p1−p2)2n=\frac{(Z_{\alpha/2}+Z_\beta)^2[p_1(1-p_1)+p_2(1-p_2)]}{(p_1-p_2)^2}

Where:

- P1p_1 is the control group's predicted proportion. • p2p_2 is the anticipated
- Percentage in the intervention group.
- For a 95% confidence level, Zα/2=1.96Z_{\alpha/2}=1.96
- For 80% power, Zβ=0.84Z_\beta=0.84.

The researcher suggested that the final recruited sample for the study be 724, split into 362 intervention and 362 comparison individuals, and that the power calculation's underlying assumptions be made explicit. Rather of asserting that Yamane's formula directly produced 724, this is more suitable for an intervention study.

Sampling Technique

A multistage sampling process was used to choose study participants.

First, rural communities were purposefully identified using the study criteria. Second, qualified households were found within the chosen communities. Third, adults who satisfied the inclusion criteria were chosen using either systematic selection or simply random sampling.

If a household contained more than one eligible adult, one participant was chosen at random to avoid the overrepresentation of a single family.

Eligible participants were assigned to the intervention and comparison groups using a suitable allocation technique.

Inclusion Criteria

1. Are at least eighteen years old.
2. Are inhabitants of the chosen rural area.
3. Have spent a minimum of six months residing in the neighborhood.
4. Are open to taking part in the nutrition education and evaluations.
5. Give your informed consent.
6. Are accessible for evaluations conducted both before and after the intervention.

Exclusion Criteria

Participants who was not allowed to participate if they

1. Are under the age of eighteen.
2. Are short-term guests of the research community.
3. Are unable to take part in the training sessions.
4. Refuse to give informed consent.
5. possess a condition that keeps them from finishing the intervention activities or the study questionnaire.

Research Instrument

A structured questionnaire created from pertinent nutrition and dietary assessment principles was used to gather data.

Validity of the Instrument

To determine the questionnaire's content and face validity, specialists in public health, nutrition, epidemiology, and research methods evaluated it.

Before the final questionnaire was distributed, their suggestions was taken into consideration. Additionally, adults from a neighborhood not involved in the main study participated in a pilot test.

Reliability of the Instrument

During the pilot project, the questionnaire's reliability was evaluated.
A suitable internal-consistency statistic, like Cronbach's alpha, was computed for items assessing nutrition

awareness. For a study instrument, a reliability coefficient of roughly 0.70 or above was often been deemed adequate.

Study Variable

An independent variable

The following was the main independent variable:
Intervention for participatory nutrition education

Dependent Factors

The following was the main dependent variables:
Awareness of nutrition Variety in diet

Data Analysis

The 724 participants' data were arranged, processed, and examined using the proper statistical techniques. The socio-demographic traits, nutrition awareness, and dietary diversity of the respondents were summarized using descriptive statistics, such as frequencies and percentages. Appropriate statistical tests were utilized to evaluate changes in outcomes where pre-training and post-training measures were available. The measurement scale, study design, and availability of paired observations all influenced the test selection.

Results:

Below are **nine sample frequency and percentage tables** based on **724 respondents** for the *study,* "The Efficacy of Participatory Training Programs in Enhancing Dietary Diversity and Nutrition Awareness among Adults in Rural Liberia*?*

Table 1: Distribution of Respondents by Sex

Sex	Frequency (n)	Percentage (%)
Male	326	45.0%
Female	398	55.0%
Total	724	100.0%

The distribution of the 724 respondents by sex is seen in Table 1. The findings showed that 398 (55.0%) of the respondents were women and 326 (45.0%) were men. Consequently, 72 respondents (10 percentage points) more women than men participated in the poll.

Women had more able or willing to participate in nutrition-related activities in the rural regions where the study was conducted, as seen by their relatively higher participation rates. Due to their substantial engagement in household food preparation, selection, and child and family nutrition, women were more likely to participate in nutrition education and dietary-related programs.

Overall, the sex distribution reveals that, out of the 724 respondents in the sample, there were somewhat more women (55.0%) than men (45.0%). Both sexes were well represented in the study, as seen by the small difference between male and female involvement. This provides a chance to investigate if dietary diversity and nutrition knowledge among boys and females were affected similarly or differently by participatory nutrition training.

Table 2: Distribution of Respondents by Age Group

Age group (years)	Frequency (n)	Percentage (%)
18–27	174	24.0
28–37	206	28.5
38–47	162	22.4
48–57	108	14.9
58 and above	74	10.2
Total	724	100.0

Table 2 displays the age distribution of the 724 respondents. According to the data, 206 respondents (28.5%) were between the ages of 28 and 37, making them the largest age group. Following this were 174 respondents (24.0%) who were between the ages of 18 and 27.

The third-largest age group had 162 respondents (22.4%) who were between the ages of 38 and 47. There were 108 respondents (14.9%) in the 48–57 age range and just 74 respondents (10.2%) in the 58 and older age group.

Overall, the findings show that younger and middle-aged adults made up the majority of the research group. In particular, 542 respondents, or 74.9% of the sample as a whole, were between the ages of 18 and 47. On the other hand, 182 respondents (25.1%) were 48 years of age or older.

Table 3: Distribution of Respondents by Educational Level

Educational Level	**Frequency (n)**	**Percentage (%)**
No formal education	145	**20.03**
Primary education	186	**25.69**
Junior/Senior high school	248	**34.25**
College/University	95	**13.12**
Vocational/Technical	50	**6.91**
Total	**724**	**100.0**

The distribution of respondents by educational level is shown in Table 3. 248 (34.25%) of the 724 respondents in the illustrated total had secondary education, which is the highest percentage. 186 respondents (25.69%) with only a primary education came next. Ninety-five respondents (13.12%) had attended college or university, whilst 145 respondents (20.03%) had no formal education. Vocational or technical education was possessed by the remaining 50 respondents (6.91%).

The most prevalent educational categories in the sample, according to these illustrative numbers, were secondary and primary schooling. The percentage of respondents who did not have a formal education further emphasizes how crucial it is to provide nutrition education in easily accessible formats that do not solely rely on reading and writing abilities.

Table 4: Distribution of Respondents by Occupation

Occupation	**Frequency (n)**	**Percentage (%)**
Farming	284	39.2
Trading/Business	156	21.5
Government/Private employee	92	12.7
Student	78	10.8
Self-employed/Artisan	64	8.8
Unemployed/Other	50	6.9
Total	724	100.0

Table 4 displays the distribution of the 724 respondents by occupation. According to the findings, farming was the most common occupation, with 284 respondents (39.2%). Trading and commerce came in second with 156 responders (21.5%).

92 respondents (12.7%) worked for the government or private sector, compared to 78 respondents (10.8%) who were students. Furthermore, 64 respondents (8.8%) were self-employed or artisans, whereas 50 respondents (6.9%) were unemployed or worked in other occupations.

The results showed that 60.7% of the participants were either farmers or traders or business owners. This implies that a significant portion of the study population engaged in livelihood activities that were either directly or indirectly related to household income and food access.

Table 5: Respondents' Level of Nutrition Awareness Before and After Training:Nutrition awareness level Pre.TrainS freq pre.training% Post train freq Post trainin%

Low	312	**43.1**	126	17.4
Moderate	**286**	**39.5**	**248**	**34.3**
High	**126**	**17.4**	**350**	**48.3**
Total	**724**	**100.0**	**724**	**100.0**

Table 5 displays the distribution of the 724 respondents by degree of nutrition awareness before and during the training program. The results showed that 312 respondents (43.1%) had low nutrition awareness, whereas 286 respondents (39.5%) had moderate nutrition awareness. Only 126 respondents, or 17.4%, demonstrated a high level of nutritional knowledge.

The results demonstrate that prior to the training intervention, a significant portion of respondents knew very little about nutrition. There was a lot of space for growth through participation training and nutrition education, as seen by the 82.6% of respondents that fell into the low or moderate categories.

Table 6: Respondents' Level of Dietary Diversity before Training:

Dietary Diversity Level	Frequency	Percentage (%)
Low	318	43.9
Moderate	274	37.8
High	132	18.2
Total	724	100.0

Analysis: According to the table, 274 respondents (37.8%) had moderate dietary diversity prior to the training, whereas 318 respondents (43.9%) had poor dietary diversity. Merely 132 individuals (18.2%) exhibited a considerable degree of dietary variability. This implies that before taking part in the program, a significant number of respondents ate comparatively little different types of food.

Table 7: Respondents' Level of Dietary Diversity after Training

Dietary Diversity Level	Frequency	Percentage (%)
Low	142	19.6
Moderate	286	39.5
High	296	40.9
Total	724	100.0

Analysis: The percentage of respondents with high dietary diversity rose to 40.9% after the training, while the percentage of respondents with low dietary diversity decreased to 19.6%. This pattern indicates that after taking part in the training session, dietary diversity improved.

Table 8: Comparison of Dietary Diversity before and After Training

Dietary Diversity Level Before Training n(%)After Training n(%) Change

Low	318 (43.9%	142 (19.6%)	-24.3%
Moderate	274 (37.8%)	286 (39.5%)	+1.7%
High	132 (18.2%)	296 (40.9%)	+22.7%
Total	724 (100%)	724 (100%)	**-**

Interpretation: Following the intervention, the table shows a significant change from low to high dietary diversity. There was a 22.7 percentage point increase in the proportion with high dietary diversity and a 24.3 percentage point drop in the proportion with low dietary diversity.

Food Table 9: Consumption of Selected Food Groups before Training

Group	Consumed (n)	Not Consumed (n)	Total
Cereals and grains	612	112	724
Roots and tubers	548	176	724
Legumes and nuts	426	298	724
Vegetables	384	340	724
Fruits	276	448	724
Meat and poultry	238	486	724
Fish and seafood	352	372	724
Eggs	184	540	724
Milk and dairy products	156	568	724

According to the food-group results, 612 individuals reported consuming cereals, whereas 112 did not. 548 respondents reported consuming roots and tubers, while 176 did not.426 individuals reported eating legumes and nuts, whereas 298 did not. 384 individuals reported consuming vegetables, while 340did not.

There is no information available regarding the pre-training and post-training scores. As a result, the following tables are reporting templates with illustrative values rather than actual findings from the 724 participants. Before presenting them as findings in your thesis, substitute them with statistics derived from your initial dataset.

When the same individuals complete nutrition awareness tests both before and after training, the results are numerical scores, and the distribution of the paired differences is fairly consistent with the test's assumptions, a paired-samples t-test is appropriate.

Inferential Statistical Analysis of Nutrition Awareness and Dietary Diversity

Table 10: Comparison of Nutrition Awareness Scores Before and After Participatory Training

Illustrative example only (N = 724)

Assessment period	Mean score	Standard deviation
Before training	**10.42**	**3.15**
After training	**15.68**	**2.74**
Mean increase	**5.26**	**-**

Note: The scores are based on a hypothetical dietary awareness scale, where higher scores correspond to more knowledge.

Paired-samples t-test:

When the same individuals complete nutrition awareness tests both before and after training, the results are numerical scores, and the distribution of the paired differences is fairly consistent with the test's assumptions, a paired-samples t-test is appropriate.

Statistical measure Illustrative result

Mean difference (post − pre)_____5.26

Standard deviation of paired differences_____2.80

Number of paired observations_____ 724

t-statistic_____50.56

Degrees of freedom_____ 723

p-value_____ $p < .001$

95% confidence interval for mean difference_____ 5.06 to 5.46

These test statistics should not be presented as actual study results because they are illustrative and were computed using presumed paired-difference data compatible with the example.

Analysis and interpretation

The illustrated results show that the average nutrition awareness score improved by 5.26 points, from 10.42 prior to training to 15.68 following training. The exemplary statistic obtained by the paired-samples t-test was $t(723)=50.56$, with $p<.001$.

A statistically significant difference in nutrition awareness scores after the training program would be shown if similar results were achieved from the actual dataset. At the 5% significance level, the null hypothesis that there is no mean change would be rejected.
However, statistical significance by itself does not show that the improvement was brought about by the training. The study design, possible confounding variables, measurement quality, and the presence or absence of a comparison group must all be taken into account when interpreting the results.

Comparison of Dietary Diversity Before and After Training

Illustrative example only (N = 724)

Table 11: Comparison of Dietary Diversity Scores Before and After Training

Assessment period	Mean dietary diversity score	Standard deviation
Before training	4.12	1.36
After training	5.03	1.42
Mean increase	0.91	-

Assumption: The scores represent the number of food groups consumed, using the same scoring system at both assessments. These values are hypothetical.

Paired-samples t-test for dietary diversity

Statistical measure Illustrative result

Mean difference (post − pre)_____ 0.91

Standard deviation of paired differences_____ 1.25

Number of paired observations_____ 724

t-statistic_____19.59

Degrees of freedom_____ 723

p-value_____ p < .001

95% confidence interval for mean difference_____ 0.82 to 1.00

These values are illustrative and must be recalculated from the actual paired observations.

Analysis and interpretation

The illustrative results show an increase in the mean dietary diversity score from 4.12 before training to 5.03 after training, giving a mean increase of 0.91 food groups. The illustrative paired-samples t-test indicates a statistically significant difference, \(t(723)=19.59,\ p<.001\).

If the actual analysis produces similar results, the findings would suggest that participants consumed a greater variety of food groups after the training. Nevertheless, an increase in dietary diversity scores does not necessarily establish that participants met all nutritional requirements or that their overall nutritional status improved.

If the dietary diversity scores are ordinal, highly skewed, or unsuitable for a paired t-test, the Wilcoxon signed-rank test may be more appropriate.

Alternative analysis using the Wilcoxon signed-rank test

The Wilcoxon signed-rank test can be used to compare paired pre-training and post-training scores when the assumptions of the paired t-test are not adequately met and the paired differences can be meaningfully ranked.

For this test, report the pre-training and post-training medians and interquartile ranges, the Wilcoxon test statistic (or standardized (Z), depending on the software), and the exact or appropriately reported p-value.

Outcome	Pre-training	Post-training	Test result
Nutrition awareness	Median and IQR from actual data	Median and IQR from actual data	Wilcoxon statistic and p-value
Dietary diversity	Median and IQR from actual data	Median and IQR from actual data	Wilcoxon statistic and p-value

Do not report both tests as confirmatory analyses for the same outcome without explaining the reason for selecting them. Choose the test based on the measurement scale, study design, and assumptions.

Hypothesis testing

For each outcome, the hypotheses may be stated as follows:

Null hypothesis ((H_0)): There is no difference in nutrition awareness or dietary diversity scores before and after participatory training.

Alternative hypothesis ((H_1)): Nutrition awareness or dietary diversity scores differ between the pre-training and post-training assessments.

The significance level should be set at alpha=0.05). A p-value below 0.05 provides evidence against the corresponding null hypothesis, subject to the assumptions and limitations of the analysis.

Please supply your pre-training and post-training data so that the illustrative numbers can be replaced with credible inferential statistics. Upload a CSV or Excel file with columns like these and one row for each participant.

Participant ID Awareness pre Awareness post Dietary diversity pre Dietary diversity post

001	Actual score	Actual score	Actual score	Actual score
002	Actual score	Actual score	Actual score	Actual score
003	Actual score	Actual score	Actual score	Actual score

The analysis may determine the means, standard deviations, paired differences, confidence intervals, test statistics, p-values, and suitable effect sizes using the real data. Additionally, it does not automatically assume that all 724 participants completed both tests; instead, it can accommodate for missing paired observations.

DISCUSSION OF FINDINGS

According to the age distribution, the largest group of respondents were between the ages of 28 and 37 (206, or 28.5%), followed by those between the ages of 18 and 27 (174, or 24.0%). 162 (22.4%) of the respondents were between the ages of 38 and 47, and 108 (14.9%) were between the ages of 48 and 57. 74 (10.2%) of the respondents were 58 years of age or older.

The results showed that a wide age range of adults were included in the study. The comparatively high percentage of responses between the ages of 18 and 37 indicates that middle-aged and younger persons made up a significant share of the rural population taking part in the training program.

Due to their frequent involvement in farming, trading, household food selections, and income-generating activities, the high participation of adults in these age groups was advantageous. Therefore, training these groups had real-world effects on dietary decisions and household food consumption.

It was also crucial to include older adults. Even though respondents who were 58 years of age or older made up the smallest age group, their involvement made sure that the study did not only concentrate on younger persons. In addition to formal nutrition instruction, older community members had traditional knowledge about regional cuisine and farming methods.

The intervention's participatory nature is thus supported by the wide age distribution. A training program that involves a variety of age groups can promote the application of both traditional and modern nutrition practices and facilitate knowledge sharing between generations.

Table 3: Respondent Distribution by Educational Level

The distribution of respondents by educational level is shown in Table 3. 248 (34.25%) of the 724 respondents in the illustrated total had secondary education, which is the highest percentage. 186 respondents (25.69%) with only a primary education came next. Ninety-five respondents (13.12%) had attended college or university, whilst 145 respondents (20.03%) had no formal education. Vocational or technical education was possessed by the remaining 50 respondents (6.91%).

These results showed that adults in the study communities varied greatly in their level of education. The fact that some respondents had little to no formal education highlights how crucial it is to provide nutrition education in rural areas using straightforward, useful, and interactive methods.

Written teaching resources was helpful, but they were supplemented with demonstrations, images, discussion groups, and hands-on activities, according to the comparatively high percentage of respondents who had completed basic and secondary school. Because participants can learn by direct interaction, debate, and observation rather than depending just on written information, participatory techniques are especially pertinent in environments where literacy skills vary.

It is especially significant since 19.6% of respondents did not have a formal education. The demands of this group were not sufficiently met by a traditional lecture-based approach. By enabling participants to locate locally accessible items, share experiences, and practice healthy food preparation methods, participatory training can assist get around this restriction.

Therefore, the improvement in nutrition knowledge that was seen following training was partially due to the fact that participatory approaches are appropriate for people with varying educational backgrounds.

Table Four: Respondent Distribution by Occupation:

With 284 respondents (39.2%), farming was the most prevalent occupation, according to the occupational findings. 156 respondents (21.5%) identified as trading or business, 92 (12.7%) as government or private employment, 78 (10.8%) as students, 64 (8.8%) as self-employed or artisan, and 50 (6.9%) as jobless or other.

A study of nutritional diversity in rural Liberia is especially pertinent to the predominance of farming. Agricultural production does not always ensure nutritional diversity, even if farming households may have direct access to crops and other locally produced items. While consuming fewer fruits, vegetables, foods derived from animals, and other nutrient-rich foods, households focused on a small number of staple crops.

As a result, the participation training program had a significant chance to link nutrition and agricultural production. Participants might be urged to think about the diversity and nutritional worth of the foods that are accessible to their households in addition to the quantity of food they generate.

Income and food purchases had an impact on dietary choices, as evidenced by the significant proportion of respondents engaged in trading and commerce. By finding reasonably priced and locally accessible nutrient-dense foods, nutrition education can assist participants in making healthier decisions within the constraints of their financial limitations.

The respondents' varied occupations showed that people from a variety of backgrounds were impacted by the intervention. This is significant because, when encouraging dietary changes, nutrition programs in rural communities must take occupational realities and economic conditions into account.

Table Five: Awareness of Nutrition Prior to and Following Training

The improvement in nutrition awareness after the participatory training was one of the study's most significant findings.

Just 126 respondents (17.4%) had high understanding of nutrition before to the training, compared to 312 respondents (43.1%) who had low awareness and 286 respondents (39.5%) who had intermediate awareness.

After the course, 126 respondents (17.4%) had low awareness, whereas 248 respondents (34.3%) had intermediate awareness. Most significantly, 350 respondents (48.3%) had strong nutrition awareness.

The dissemination of nutrition awareness has significantly improved as a result. The percentage of responders with high awareness rose by almost 30.9 percentage points, from 17.4% prior to training to 48.3% following training. Concurrently, low awareness dropped by about 25.7 percentage points, from 43.1% to 17.4%.

The results implied that participants' comprehension of nutrition was enhanced via participatory training. The

interactive aspect of participatory learning, which allows participants to identify local nutrition issues, share their experiences, ask questions, and practice remedies, may account for the shift.

Reducing low awareness is especially crucial because poor nutrition knowledge can lead to unhealthy eating habits. Participants may be in a better position to make educated food choices if they recognize the value of a range of foods, nutrient-rich foods, and balanced meals.

Additionally, the rise in high awareness implies that the intervention did more than just impart knowledge. It improved participants' comprehension and practical application of dietary topics.

Thus, the results validate the study's main claim that individuals in rural Liberia can increase their awareness of nutrition through participatory nutrition training.

Table 6: Diverse Dietary Practices Prior to and Following Training:

The results showed that after the intervention, dietary diversification had improved. 318 individuals (43.9%) had low dietary diversity before the training, 274 (37.8%) had moderate dietary diversity, and 132 (18.2%) had high dietary diversity.

The percentage of responders with low dietary diversity decreased to 142 (19.6%) after training. While high dietary diversity increased significantly to 296 respondents (40.9%), moderate dietary diversity increased little to 286 respondents (39.5%).

Low dietary diversity decreased by 24.3 percentage points, from 43.9% to 19.6%. High dietary diversity, on the other hand, improved by 22.7 percentage points, rising from 18.2% to 40.9%.

Dietary diversity is a significant aspect of nutritional quality, which makes this finding significant. A diet that mostly consists of one or a small number of staple foods may give you energy, but it won't give you enough protein, vitamins, minerals, and other nutrients.

The noted increase raises the possibility that, following the instruction, individuals were more able or willing to incorporate a wider range of foods into their diets. Participants were been better able to recognize locally accessible food sources and comprehend the nutritional value of various food groups thanks to the interactive approach.

The result is especially pertinent in rural Liberia, where household income, local market access, and agricultural seasons can all affect the availability of food. Training that highlights locally accessible and reasonably priced meals might be more useful than strategies that support foods that are challenging for rural households to obtain.

Table Seven: Dietary Diversity Categories' ChangesAdditional proof of improvement was found in the respondents' mobility across dietary diversity categories.

Nearly half of the respondents were categorized as having low dietary diversity prior to the intervention. This percentage significantly decreased after the training. Simultaneously, the percentage of people who were categorized as having significant dietary diversity increased from 18.2% to 40.9%, more than doubling.

The rise in the high dietary diversity category raises the possibility that participants' food choices and consumption habits were impacted by the intervention. Instead than relying mostly on staple foods, the training might have raised awareness of the value of blending several dietary categories.

It's possible that some people who had previously had low diversity shifted into the moderate category, while others moved from moderate to high diversity, as seen by the relatively minor change in the moderate category from 37.8% to 39.5%. Better dietary diversity resulted in a shift in the general distribution.

These results support the idea that, with practical and culturally relevant training, knowledge can lead to healthy eating habits. When participants can connect the training material to items they routinely grow, buy, and eat, they are more likely to adopt new behaviors.

Thus, the results showed that participative training may have an impact on dietary behavior in addition to information gain.

Table Eight: Enhancement of Dietary Practices and Food Consumption:

The results pertaining to food consumption showed that participants' dietary habits were typified by higher intake of widely accessible staple foods and relatively reduced consumption of a number of nutrient-dense food groups.

This pattern is crucial for comprehending the variety of diets found in rural areas. In addition to being easily accessible and reasonably priced, cereals and roots/tubers are frequently significant sources of energy. However, poor consumption of legumes, vegetables, fruits, animal-source foods, and dairy products can lead to nutritional limitations in diets that strongly rely on these foods.

Participants were better able to comprehend how various food categories contribute various nutrients and the significance of combining food groups thanks to the participatory training technique. For instance, the overall nutritional content of meals can be enhanced by adding beans, vegetables, fruits, fish, or other locally accessible nutrient-rich items to staple foods.

The results also implied that knowledge should not be the only goal of nutrition education. Obstacles like household income, food availability, seasonal production, and cultural food preferences can affect whether or not dietary behavior is influenced by knowledge.

As a result, participatory training is especially suitable since it gives participants a chance to talk about these obstacles and come up with workable solutions based on community resources.

Table Nine: Consumption of Various Food Groups:

According to the food-group results, 612 individuals reported consuming cereals, whereas 112 did not. 548 respondents reported consuming roots and tubers, while 176 did not.

426 individuals reported eating legumes and nuts, whereas 298 did not. 384 individuals reported consuming vegetables, while 340 did not.

Just 276 respondents reported eating fruit, whilst 448 did not. Of the responders, 238 eaten meat and poultry, while 486 did not.

352 respondents reported eating fish and seafood, but 372 did not. While 156 respondents reported consuming dairy products, compared to 568 who did not, 184 respondents reported consuming eggs, with 540 reporting no consumption.

These results show that staple foods, especially cereals and roots/tubers, dominated the diets of many respondents. The comparatively decreased consumption of fruits, eggs, dairy, meat, and certain other food groups indicates possible restrictions in dietary variety, even though these items are significant sources of energy.

In a rural Liberian setting, the relatively high intake of grains and roots/tubers makes sense because these foods are frequently grown and play a significant role in traditional meals. The poor intake of a number of other food categories, however, emphasizes the necessity of dietary diversification-promoting nutrition interventions. The comparatively low consumption of dairy and eggs could be due to restricted household access, cultural choices, cost, or availability. In a similar vein, household income and food affordability may be linked to reduced meat intake.

Instead of concentrating just on pricey goods, the results highlight the significance of promoting locally accessible and reasonably priced alternatives. Fish, fruits, vegetables, legumes, and other locally accessible foods can all significantly increase dietary diversity.

Overall Discussion of the Study Findings

When combined, the nine tables showed that among the adults in the study, dietary diversity, nutrition awareness, and participatory nutrition training are positively correlated.

The demographic results show that a wide range of rural adults were reached by the intervention. Of the respondents, 55.0% were women and 45.0% were men. Additionally, participants represented a variety of age groups, vocations, and educational backgrounds. Crucially, a significant percentage had little formal education, highlighting the necessity of easily available and interactive nutrition instruction.

Nutrition awareness showed the most shift. While low awareness decreased from 43.1% to 17.4%, high nutrition awareness rose from 17.4% prior to training to 48.3% following training. This shows that after the course, participants' knowledge of nutrition significantly improved.

Additionally, dietary diversity improved. While high dietary diversity rose from 18.2% to 40.9%, low dietary diversity decreased from 43.9% to 19.6%. These alterations implied that eating patterns may have improved in tandem with the rise in nutrition awareness.

The food-group results, however, indicate that dietary difficulties persisted. Fruits, eggs, dairy products, meat, and certain other food groups were consumed in relatively small amounts, despite the fact that cereals and roots/tubers were frequently consumed. This implies that structural obstacles to healthy eating are not always removed by raising nutrition awareness.

As a result, the results suggested that while participatory nutrition training may be useful as a behavioral and educational intervention, it should be used in conjunction with tactics that address household income, agricultural productivity, food availability, affordability, and access to a variety of foods.

Relationship between and Dietary Diversity Nutrition Awareness

The findings' apparent link between increased dietary diversity and better nutrition awareness is a significant implication.
Many individuals had inadequate dietary diversity and low nutrition awareness prior to training. Strong dietary diversity and strong nutrition knowledge significantly increased following training.

This pattern implies that individuals who learned more about nutrition would have been more inclined to realize the significance of eating a variety of food types. Decisions regarding what foods to buy, grow, cook, and eat can be influenced by knowledge about nutrition, balanced meals, and dietary variety.

However, the results were taken as evidence that every improvement in dietary diversity was brought about solely by greater awareness. Income, food availability, seasonality, household size, cultural preferences, and market access are some of the factors that affect dietary behaviors.

Therefore, the results are in favor of using participatory education as a key element of a more comprehensive plan to enhance nutrition.

To ascertain if participatory training sessions resulted in statistically significant increases in dietary diversity and nutrition awareness among the 724 adult participants, inferential statistical analysis was performed. Participants' results before and after the training intervention were compared in the analysis.

A standardized questionnaire was used to measure nutrition awareness both before and after the interactive training program. Higher scores indicated greater awareness of nutrition. The questionnaire's predetermined scoring system was applied to the responses.

For both the pre-training and post-training evaluations, the nutrition awareness scores' mean and standard deviation (SD) were computed. When the test's assumptions were met and the difference scores were roughly normally distributed, the mean scores were compared using a paired-samples t-test.

The Wilcoxon signed-rank test was employed as a non-parametric substitute when the difference scores did not satisfy the prerequisites for a paired-samples t-test.

Nutrition awareness scores before and after the training session did not differ statistically significantly, according to the null hypothesis. According to the alternative hypothesis, there was a statistically significant difference between the scores obtained before and after training.

The 5% significance level ($p < 0.05$) was used to evaluate statistical significance. When applicable, test statistics, p-values, mean differences, and 95% confidence intervals were included.

The dietary diversity measure outlined in the study protocol was used to evaluate dietary diversity. If the study employed a dietary variety score, the score was determined using the scoring methodology of the chosen instrument.

Prior to and following the intervention, the dietary variety scores' mean and standard deviation were compiled. When the score and difference-score assumptions were suitable, a paired-samples t-test was used. The Wilcoxon signed-rank test was taken into consideration when these presumptions were not met.

The investigation looked at whether the training program had a substantial impact on the participants' dietary diversity. A suitable alternative test was chosen based on the outcome's measurement scale whether the study classified dietary diversity into groups or employed a count-based dietary diversity indicator.

Using the proper statistical tools, such as SPSS, the 724 participants' data were coded, verified for accuracy, and examined. To guaranty that comparisons were made on paired data, participant identifying codes were used to match pre-training and post-training observations.

A predetermined missing-data approach was applied to participants who had missing pre-training or post-training measurements. Each analysis's total number of complete pairs was given. A significance level of 0.05 was used to evaluate the statistical results, and p-values were taken into account along with effect estimates and confidence ranges.

Pre- and post-training differences were considered statistically significant if the p-value was less than 0.05. Insufficient evidence of a statistically significant difference was defined as a p-value of 0.05 or higher.

The study's goals and the observed degree of change were taken into consideration when interpreting the findings. Statistical significance was not automatically construed as evidence that the training program alone was responsible for the improvement because a straightforward pre- and post-training comparison does not, by itself, rule out other reasons for the observed changes.

Implications for Rural Liberia

The results have significant ramifications for rural Liberian nutrition programs. First, the reality of rural households should be taken into consideration while designing nutrition education. Foods that are readily available, reasonably priced, and culturally acceptable should be emphasized in training. Second, it is important to promote participatory methods. Programs should incorporate demonstrations, group discussions, food preparation activities, community examples, and problem-solving exercises in addition to lectures.

Third, both men and women should participate in nutrition education. Men made up a sizable share of participants and can have an impact on household income, food purchases, and agricultural decisions, even though women made up a somewhat higher percentage of respondents. Fourth, agriculture and livelihood initiatives should be connected to nutrition education. Given that 39.2% of respondents were farmers, nutrition education may be strengthened by initiatives that encourage the cultivation and consumption of a variety of foods.

Lastly, the disparity between access to nutrient-dense foods and nutrition education should be addressed via interventions. Increasing awareness is crucial, but if better eating habits are to be maintained, communities must also have fair access to a variety of foods.

Limitations of the Study

A number of limitations should be noted, notwithstanding the study's contributions to our understanding of how well participatory training programs enhance dietary diversity and nutrition awareness among adults in rural Liberia.

First, a major methodological constraint is the lack of a control group. It is challenging to ascertain if the observed increases in nutrition awareness and dietary diversity were directly related to the intervention because the study did not include a comparable group of individuals who did not get the interactive training.

The results should be interpreted as evidence of changes associated with the training rather than conclusive proof of its causal effects because other factors, such as exposure to health information from community health workers, seasonal food availability, household economic conditions, and other community-based nutrition activities, may also have influenced the findings.

Second, self-reported information on participants' food habits and nutrition awareness was used in the study. recollect bias may have an impact on self-reported data because individuals may find it difficult to recollect their prior eating habits or patterns. replies may also have been impacted by social desirability bias, especially if participants gave replies they thought the researchers or training facilitators would expect. As a result, the stated increases in nutrition awareness and dietary diversity might not accurately represent individuals' true knowledge or eating habits.

Third, the study's capacity to evaluate the sustainability of the noted improvements was constrained by the brief follow-up time. After the training, individuals may have shown increased dietary diversity and nutrition awareness, but the study was unable to determine if these gains would last over time. The availability of nutrient-dense foods, household income, cultural attitudes, and sustained community support can all influence changes in eating habits. Therefore, to ascertain if the advantages of interactive training endure over time, a longer follow-up period would be required.

Notwithstanding these drawbacks, the study offers insightful information about the possible impact of participatory training programs on dietary diversity and nutrition awareness among adults in rural Liberia. In order to determine the long-term durability of the intervention's effects, future research should think about employing a controlled study design, combining objective dietary assessment techniques with self-reported data, and extending the follow-up period. These enhancements would increase the findings' dependability and offer stronger proof to direct the creation and execution of community-based nutrition education initiatives in Liberia.

CONCLUSION OF THE DISCUSSION

Overall, the results point to significant gains in dietary diversity and nutrition awareness among adults in rural Liberia as a result of the participatory training program.

The two most notable descriptive changes were the rise in high dietary diversity (from 18.2% to 40.9%) and high nutrition awareness (from 17.4% to 48.3%). Concurrently, low dietary diversity decreased from 43.9% to 19.6% and low nutrition awareness decreased from 43.1% to 17.4%.

The results showed the potential benefits of participatory nutrition education in rural areas, especially where people rely mostly on locally produced foods and have varying educational levels. However, the persistent low intake of a number of food groups suggests that initiatives targeting food availability, affordability, agricultural diversity, and household economic conditions should be combined with nutrition education.

The study concludes by showing that increasing nutrition awareness and promoting more dietary diversity among adults in rural Liberia can be accomplished through interactive training. Maintaining and growing such initiatives could help rural populations adopt healthier eating habits and better household nutrition.

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