International Journal of Multidisciplinary Approach and Studies

ISSN NO:: 2348 – 537X

Perception towards Iron Fortified Rice (IFR) Among the Pregnant and Lactating Mothers in Selected Barangays of Maramag, Bukidnon

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ABSTRACT

The study aimed to determine the perception towards Iron Fortified Rice (IFR) among pregnant and lactating mothers in selected Barangays of Maramag, Bukidnon. Specifically, it sought to describe the personal, socioeconomic, supportive, and psychological factors of the pregnant and lactating mothers in selected Barangays of Maramag, Bukidnon, determine the perception towards Iron Fortified Rice among the pregnant and lactating mothers, and identify the problems encountered by the pregnant and lactating mothers towards Iron Fortified Rice. Data were gathered using a questionnaire administered through personal interviews with 82 participants and analyzed through descriptive statistics such as frequency counts, percentages, ranks, mean, and correlation analysis. Participants were middle-aged, female, married from a small household family size and attained a secondary level of education, Cebuano's, Roman Catholic, private employees with low annual income and no agricultural farmland and land control. The access to credit was from lending, contact to change agent once a month with barangay nutrition scholar as their source of information, and did not attend training and seminars. Participants have "very high" aspirations and a "very favorable" attitude towards Iron Fortified Rice. Participants perceived that Iron Fortified Rice (IFR) was "very high" in observability and relative advantage, "high" in trialability and compatibility, and "moderate" in complexity. Participants encountered problems such as a lack of knowledge about iron-fortified rice, yellowish rice, similar appearance to NFA rice, and lack of training and seminars. The study suggests that the DOST-Food and Nutrition Research Institute (DOST-FNRI) may improve the dissemination of information about the distinct characteristics of Iron Fortified Rice while collaborating with the local health authorities.

KEYWORDS: *Iron Deficiency Anemia, Micronutrient, Rice Grains*

INTRODUCTION

Background of the Study

Rice (Oryza sativa L.) is the number one staple food most Filipinos consume. One of the significant concerns in the Philippines was the prevalence of micronutrient deficiency, particularly iron deficiency anemia (IDA), in all ages. The incidence of morbidity due to anemia became prevalent in Bukidnon, which was 940 cases in 2016 and 1,485 cases in 2018. Due to the prevalence of anemia, iron is introduced as the essential nutrient to surpass the

extent of the anemia by fortifying the rice consumed by the people with iron nutrients. A strategic way for nutrition to address the country's iron deficiency anemia (IDA) (Arayata, 2020).

The Philippine Food Fortification Act of 2000, or Republic Act 8976, was established to address eliminating micronutrient deficiencies. It mandates the fortification of staple foods in the country. Rice, one of the staple foods consumed by the Philippines, is an appropriate food for iron fortification to reduce iron deficiency anemia. Many of the Philippine population depend on rice for their daily caloric intake and nutritional needs (Acuin et al., 2019).

According to the DOST-Food and Nutrition Research Institute's (FNRI) in the Seventh National Nutrition Survey (17th NSS) in 2008, Iron Deficiency Anemia (IDA) was still prevalent among people of all ages. Children, the elderly, and pregnant and lactating mothers are likewise affected. The Department of Science and Technology in Region 10, together with the DOST- Food and Nutrition Research Institute (DOST-FNRI) and the Maramag Community Multipurpose Cooperative (MACO-MPC), inaugurated the first Iron Rice Fortification Processing Plant at Base Camp, Maramag, Bukidnon, last August 03, 2022. It will process the Iron Fortified Rice (IFR). It aims to address the incidence of anemia in Region 10 (DOST-10, 2022).

By this, the DOST-10 launched the first-ever project, "Strengthening and Promotion of Iron Fortified Rice for Nutrition and Overall Wellness (SAP-IFNOW)," to combat the IDA in Northern Mindanao. Moreover, as a vital component of this project, which the DOST-FNRI will carry out in collaboration with MACO-MPC, Bukidnon State University (BSU), the Provincial Health Office (PHO)/Provincial Nutrition Action Office (PNAO) of Bukidnon, and the Municipal Health Office (MHO) of Maramag, Bukidnon, a total of 100 iron-deficient residents in Maramag, Bukidnon will be used by the said project. These will give each 1kg of IFR daily for six months (Mindanao Daily News Network, 2022).

Accordingly, Bukidnon was also one of the ten poorest provinces in the Philippines in 2018(PSA,2022). Because the incidence of poverty is high, which contributes to malnourishment and nutrient deficiencies, IFR can be a solution (Atienza, 2021).The study was conducted to determine the perception of Iron-Fortified Rice (IFR) among pregnant and lactating mothers in selected barangays of Maramag, Bukidnon. The study aimed to assess the perception towards Iron Fortified Rice (IFR) among the pregnant and lactating mothers in selected Barangays of Maramag, Bukidnon. Specifically, this study aimed to describe the personal, socioeconomic, supportive, and psychological factors of the pregnant and lactating mothers in selected Barangays of Maramag, Bukidnon, determine the perception towards Iron Fortified Rice among the pregnant and lactating mothers, and identify the problems encountered by the pregnant and lactating mothers towards Iron Fortified Rice.

METHODOLOGY

Research Design and Locale of the Study

The following factors were considered while choosing the study location: the presence of Iron Fortified Rice, the presence of IFR recipients, the Barangay being accessible for easy data collection and transportation, and the Barangay's stable peace and order situation. Based on the criteria, the study was conducted in Barangay Bagong Silang, Barangay Panadtalan, Barangay Panalsalan, Barangay Bayabason, and Barangay San Roque Maramag, Bukidnon.

International Journal of Multidisciplinary Approach and Studies
ISSN NO:: 2348 – 537X

One of the twenty (20) barangays in the Municipality of Maramag, the first-class Municipality of Bukidnon in Northern Mindanao, was selected as the locale of the study: Maramag, Bukidnon located in the heart of Mindanao Island, province of Bukidnon, Philippines. Maramag is one of the provinces comprising the 3rd District of Bukidnon. Maramag originates from "Ag Ramag Ki Dini," a Manobo term "Let us eat our breakfast here."

Barangay Bagong Silang has a population of 1,024. Barangay Nutrition Scholars gave 15 pregnant and lactating mothers in the barangay Iron Fortified Rice (IFR). Barangay Panadtalan, located adjacent to San Roque and Purok 3 in the province of Bukidnon, had 27 pregnant and lactating mothers who received IFR. Barangay Panalsalan, accessible by all modes of land transportation, had 20 recipients of IFR. In Barangay Bayabason, formerly known as Spring, situated in the rural areas of the Municipality of Maramag, Bukidnon, 20 pregnant and lactating mothers were provided with IFR. Barangay San Roque, with a population of 3,604 according to the 2020 census, had 20 recipients of IFR. Figure 1 presents the map of Maramag, Bukidnon, and shows the locale of the study.

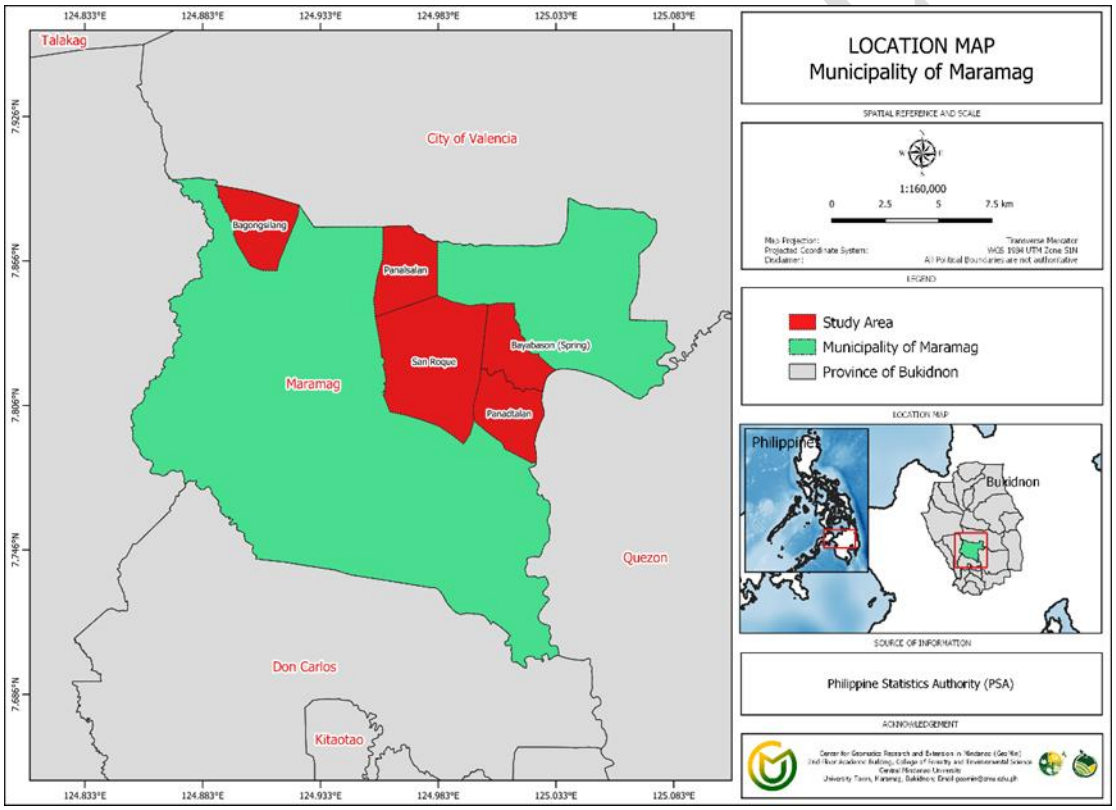

Figure 1. Map showing the locale of the study

Sampling Techniques and Research Instruments

The list of participants was taken from the Barangay Nutrition Scholars. The study used stratified random sampling. There were 102 recipients of iron-fortified rice in Barangay Bagong Silang, Barangay Panadtalan, Barangay Panalsalan, Barangay Bayabason, and Barangay San Roque, Maramag, Bukidnon. Using the Cochran Formula, 82 samples were the participants of the study.The study used a survey questionnaire to gather data. The survey

questionnaire was designed to collect information and determine the participants' perception and other information relevant to the study's objectives. The questionnaire was written in English but translated into Cebuano during the interview to ensure the participant's education would understand each question. The questionnaire had six (6) parts which cover the following: Personal Attribute, Socioeconomic Attribute, Supportive Attribute, Psychological Attribute, Perception of the participants towards Iron Fortified Rice, Problems encountered by the participants towards Iron Fortified Rice.

Data Gathering Procedure and Data Analysis

A detailed survey was conducted with the study participants, collecting data through both field and in-home interviews. Each interview lasted about 20-30 minutes and was supported by photo documentation to improve data quality. Participants were given a small token to show appreciation for their time and valuable insights. The data were grouped, categorized, and analyzed according to the study's objectives. The personal attribute, socioeconomic attribute, supportive attribute, psychological attribute, perception towards iron-fortified rice, and problems encountered were described using descriptive statistics such as frequency counts, percentages, ranks, and mean.

Ethical Considerations

The research adhered to ethical guidelines, beginning with obtaining permission from the barangays and municipalities and securing an Institutional Ethics Review Committee (IERC) Permit from CMU. Participants were informed about the study's purpose and assured of anonymity. They were invited to participate voluntarily, with the option to decline answering sensitive questions or withdraw from the study if uncomfortable. Safety measures included conducting interviews outdoors or in well-ventilated areas, with both parties wearing masks and maintaining physical distance. Participants received a token of appreciation. Signed informed consent was obtained before interviews commenced. Results were shared with the community for validation before finalizing the manuscript, promoting transparency and trust. The research aimed to benefit the community by offering insights into local perspectives, potentially informing future public health and community development initiatives.

RESULTS AND DISCUSSION

Personal Attribute

Age. Figure 2 presents the distribution of the participants according to age. It shows that slightly more than one-half (51%) of the participants were aged 26 – 35, while two-fifths (40%) were aged 17 - 25. The oldest among the participants was 47 years old, while the youngest was 17, with a mean age of 30. This implies that the majority of the participants were middle-aged. According to Department of Health (2023), age was the most significant factor influencing a woman's ability to conceive and give birth to a healthy baby. Thus, the risk of pregnancy complications increases as they age. Likewise, Meier and Sanchez (2023) state that a woman's optimal reproductive period spans from the late teens to the late 20s. The ability to conceive decreases after the age of 30, and this decline accelerates in the mid-30s. Beyond the age of 45, fertility diminishes significantly, making natural conception unlikely.

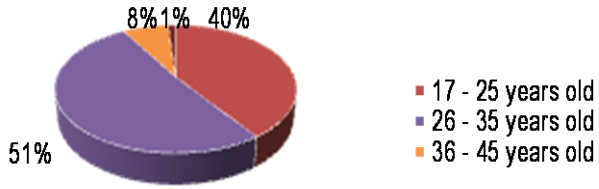

Figure 2. Distribution of participants according to age

Marital Status. Table 1 presents the distribution of the participants according to marital status. The majority (93%) of the participants were married, while less than one-tenth (6%) were single. This implies that majority of the participants have legal obligations and responsibilities. According to Adams et al. (2022), the psychological well-being of pregnant and lactating women was positively influenced by the support from their partners and the stability of their marital relationship served as the crucial protective factor. According to Abera et al. (2020), marriage was high in rural areas where agriculture was the leading employer of labor and often prioritized their family's well-being, including the food they consume.

Table 1. Distribution of participants according to marital status

MARITAL STATUS	FREQUENCY	PERCENTAGE
Married	76	93
Single	5	6
Separated	1	1
TOTAL	82	100

Household Size. Figure 3 presents the distribution of the participants according to household size. It shows that most (84%) of the participants have a household size of 1 – 5 family members, and less than one-fifth (16%) have 6 – 10 family members. This implies that most of the participants have an average household size. According to the Philippine Statistics Authority (2015), a Filipino family member's average size was five persons, each household size. According to Drammeh et al. (2019), compared to small family members, large family members put an extra burden on food consumption and are more likely to experience food insecurity and higher demands.

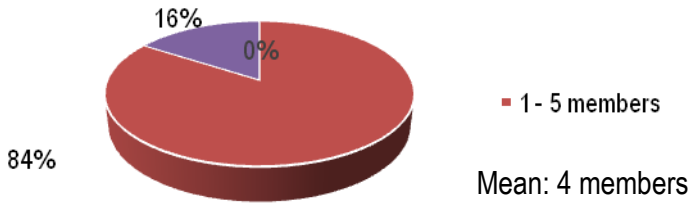

Figure 3. Distribution of participants according to household size

Socioeconomic Attribute

Educational Attainment. Figure 4 presents the distribution of the participants according to educational attainment. More than one-fourth (29%) of the participants attained high school level, while slightly more than one-fourth (26%) were high school graduates. The study indicates that the participants had attained a secondary level of education. According to Pineda (2008), the higher their educational attainment, the more they are likely to be part of programs and activities. Macha et al. (2018) stated that the country's literacy rate was secondary education.

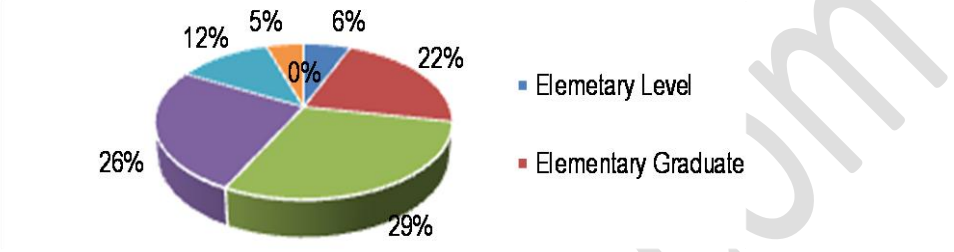

Figure 4. Distribution of participants according to educational attainment

Ethnic Origin. Table 2 presents the distribution of the participants according to ethnic origin. Three-fifths (60%) of the participants were Cebuano, while more than one-tenth (12%) were Ilonggo. This implies that most participants were migrants from the Visayas group of islands. Cebuano registered the highest proportion of ethnic groups in Northern Mindanao (Philippine Statistics Authority, 2020). Accordingly, regarding ethnic representation, the Cebuano group emerged as the predominant ethnicity, comprising 44.51 percent of all households in Bukidnon (Provincial Government of Bukidnon, 2018).

Table 2. Distribution of participants according to ethnic origin

ETHNIC ORIGIN	FREQUENCY	PERCENTAGE
Cebuano	49	60
Ilonggo	10	12
Boholano	7	9
Talaandig	6	7
Lumad	5	6
Manubo	2	3
Ilocano	1	1
Higaunon	1	1
Tribal	1	1
TOTAL	82	100

Religious Affiliation. Figure 5 presents the distribution of the participants according to religious affiliation. Data revealed that slightly less than three-fourths (72%) of the participants belonged to Roman Catholic, while less than one-tenth (1%) of them were Iglesia ni Cristo and Espiritu saKamatuoran. This indicates that most of the participants were dominated by Roman Catholic believers. This aligns with the findings of the Philippines

Statistics Authority (2017), indicating that Roman Catholics were among the religious groups with the broadest presence in Mindanao, encompassing over half of the island's population. As stated by Miller (2018), Roman Catholics constitute over 86 percent of the population in the Philippines in Asia.

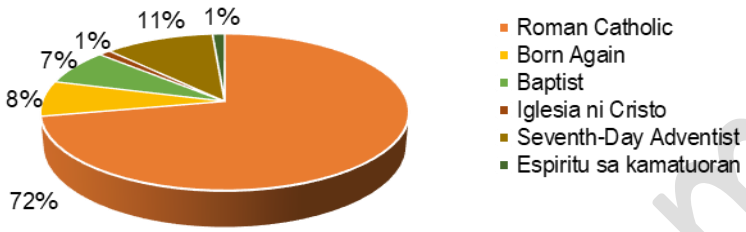

Figure 5. Distribution of participants according to religious affiliation

Annual Income. Figure 6 presents the distribution of the participants according to annual income. It shows that more than one-half (59%) of the participants obtained an income of Php61,000 – 120,000 annually, while less than one-tenth (1%) had Php241,000 – 400,000. This result indicates that most of the participants have low annual income. Accordingly, the minimum average yearly earnings in the Philippines was Php161.847.60 (Ngyuyen, 2023). As mentioned by the Philippine Statistics Authority (2018), households with annual earnings falling below the poverty threshold of Php118,380.00 are categorized as low-income households.

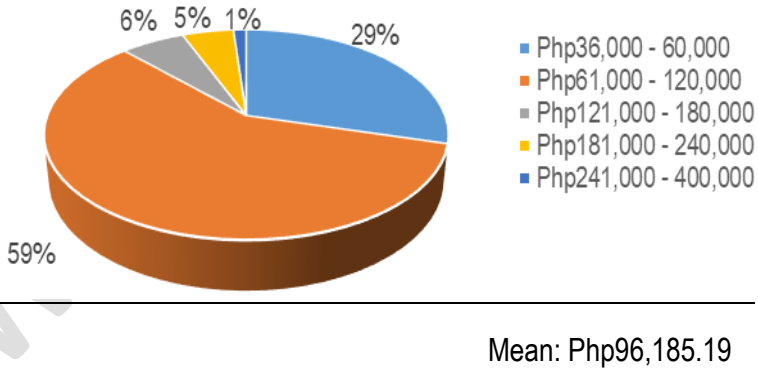

Figure 6. Distribution of participants according to annual income

Farm Size. Figure 7presents the distribution of the participants according to farm size. It shows that slightly more than one-half (51%) of the participants do not have a piece of farm size, almost one-half (45%) of the participants tilled 0.5 – 1 hectare of farmland, while less than one-tenth (4%) of them tilled 1.5 – 2 hectares of land. This implies that most of the participants were lack of agricultural land. According to National Geographic (2023), not all people living in rural areas have farmland though most people are living and working on farms, villages, towns, and small settlements surrounded by rural areas. Bellwood (2017) stated that farms with smaller sizes yield less profit compared to larger farms.

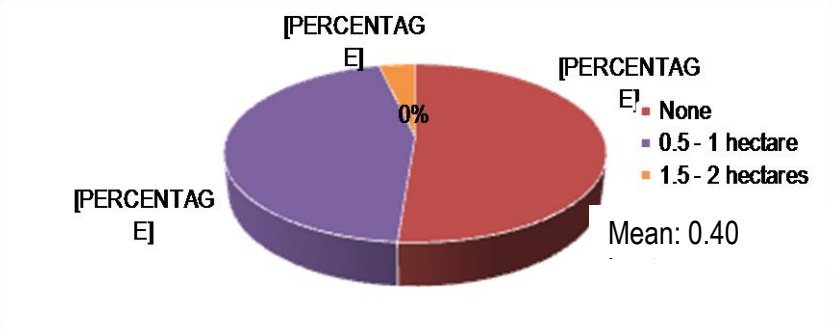

Figure 7. Distribution of participants according to farm size

Supportive Attribute

Access to Credit. Table 3 shows the distribution of the participants according to access to credit. It shows that less than three-fourths (71%) of the participant's access to credit was from lending that, in layman's terms called 5-6, while more than one-fourth (28%) of them borrowed from their friends and less than one-tenth (1%) from banks. This indicates that participants prefer to borrow in an easy way regardless of the interest they will get. According to TransUnion (2022), relying on the commitment to settle the debt later, access to credit enables individuals to acquire the necessities they require in the present moment. Punongbayan (2017) mentioned that most Filipinos borrowed more from informal sources such as lenders, family members, and friends than formal sources like banks or cooperatives as they had difficulties obtaining credit from them.

INDICATOR	FREQUENCY	PERCENTAGE
Friends	23	28
Lending	58	71
Bank	1	1
TOTAL	82	100

Table 3. Distribution of participants according to access to credit

Contact with Change Agent. Figure 8 presents the distribution of the participants according to contact to change agent. It shows that more than three-fourths (77%) of the participants have contacted Barangay Nutrition Scholar (BNS) once a month, while slightly more than one-eight (13%) of the participants contacted the change agent twice a month. This indicates an interaction between the participants and the change agent regarding information about programs and activities. According to Armin & Martin (2008), a change agent's responsibility is to shift stakeholders' perspectives towards an efficient yet unfamiliar future and facilitate the management of necessary enhancements for the future. Similarly, Bayne et al. (2018) stated that it is essential to have involvement and collaboration among change agents from various sectors to effectively address challenges in implementing programs, policies, and practices that promote health and equity in rural communities.

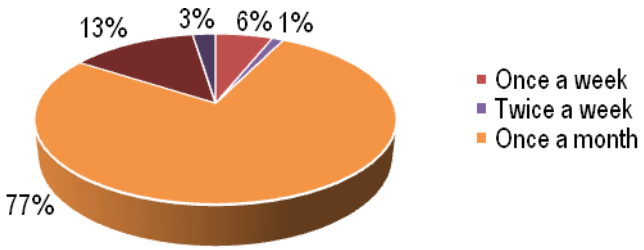

Figure 8. Distribution of participants according to contact to change

Psychological Attribute

Aspiration in Life. The data in Table 4 shows the participant's aspirations in life. Based on the result, participants have indicated very high life aspirations with an overall mean of 4.77. Notably, the participants rated very high on the following indicators: They want to provide healthy and nutritious food for their family (4.94), they want to be healthy (4.91), and they want to gain more knowledge about iron-fortified rice (4.80. This implies that participants aspire for the betterment of the family. The finding is supported by Laraki (2012), which suggests that individuals exhibit more tremendous enthusiasm for participating in agricultural programs when they harbor diverse dreams, aspirations, and expectations for the future. Team and Martin (2013) stated that goals are made impossible by the constant struggle for survival, like lack of food, inadequate shelter, and access to health care, and with this, it pushes people's vision and hopes for the future out to reach.

Table 4. Participants according to aspiration in life

INDICATORS	WEIGHTED MEAN	DESCRIPTIVE RATING
I want to send my children to school.	5.00	Very High
I want to provide healthy and nutritious food for my family.	4.94	Very High
I want to be healthy.	4.91	Very High
I want to become successful.	4.91	Very High
I want to attain a better quality of life.	4.91	Very High
I want to gain more knowledge about iron fortified rice.	4.80	Very High
I want to contribute to the improvement of the health and well-being of my community.	4.71	Very High
I want to increase my household income.	4.70	Very High
I want to help iron-deficient people.	4.54	Very High
I want to start a business.	4.33	High
OVERALL MEAN	4.77	Very High

Legend: 4.51-5.00 Very High 3.51-4.50 High 2.51-3.50 Moderate 1.51-2.50 Low 1.00- 1.50 Very Low

Attitude towards Iron Fortified Rice. Table 5 shows the participant's attitude towards Iron Fortified Rice. Based on the result, the participants had a very favorable attitude towards Iron Fortified Rice, with an overall mean of 4.54. In particular, the participants have a very favorable attitude based on the following statements: They believed Iron Fortified Rice is an

effective solution to combat iron deficiency (4.79), they believed Iron Fortified Rice could help to improve the community's health status (4.78), they believed incorporating Iron Fortified Rice into their diets can be beneficial (4.70), and they believed Iron Fortified Rice could be a great source of iron (4.63). On the other hand, participants have the favorable attitude that Iron Fortified Rice should be accessible and affordable to all (4.50), and they believed Iron Fortified Rice would be their family's daily food intake (4.30). This indicates that participants have a positive attitude towards Iron Fortified Rice. Kendra (2019) believes that attitude encompasses emotions, beliefs, and behaviors directed toward a specific object, person, thing, or event. These attitudes are formed through experience or understanding and can directly influence one's behavior. Their experiences shape a person's attitude in the past and present. According to Gharty (2014), a positive attitude influences how participants view certain programs and innovations.

Table 5. Attitude towards Iron Fortified Rice

INDICATORS	WEIGHTED MEAN	DESCRIPTIVE RATTING
I believed Iron Fortified Rice is an effective solution to combat iron deficiency.	4.79	Very Favorable
I believe Iron Fortified Rice can help to improve the community's health status.	4.78	Very Favorable
I believed Iron Fortified Rice can empower rural communities by decreasing the number of nutrient deficient individual.	4.73	Very Favorable
I believed incorporating Iron Fortified Rice into our diets can be beneficial.	4.70	Very Favorable
I believed Iron Fortified Rice can be a great source of iron.	4.63	Very Favorable
I believed Iron Fortified Rice should be accessible and affordable to all.	4.50	Favorable
I believed I will eat Iron Fortified Rice every single day to maintain my iron status.	4.39	Favorable
Ibelieved Iron Fortified Rice can be a good source of income as a business.	4.37	Favorable
I believed Iron Fortified Rice will be our family daily food intake.	4.30	Favorable
Ibelieved Iron Fortified Rice can gain higher profits as a business.	4.22	Favorable
OVERALL MEAN	4.54	Very Favorable

Legend: 4.51-5.00 Very Favorable 3.51-4.50 Favorable 2.51-3.50 Moderately Favorable
1.51-2.50 Less Favorable 1.00-1.50 Not Favorable

Perception of Participants towards Iron Fortified Rice (IFR)

Relative Advantage. Table 6 presents the perception of participants towards iron iron-fortified rice in terms of relative advantage, with an overall mean of 4.54, which indicates a very high level. Results show that Iron Fortified Rice is highly nutritious than other rice

varieties (4.70), Iron Fortified Rice is composed of essential micronutrients compared to the other rice varieties (4.55), and fortified Rice can aid back the iron nutrient compared to the other fortified products (4.76), Iron Fortified Rice is a good quality of rice than other rice varieties (4.46), Iron Fortified Rice is more resistant to pests and other diseases than other milled rice (4.01), and it is more convenient because it is cheaper than other fortified products (4.44). This indicates that participants perceived Iron Fortified Rice as relatively advantageous. As mentioned by Bhasin (2019), the acceptance rate of a new product or service correlates directly with the relative advantage it offers. In simpler terms, the higher the advantage a product provides, the more likely it is to be accepted by the target consumer, and conversely, a lower advantage would result in lower acceptance.

Table 6. Perception towards Iron Fortified Rice (IFR) among the participants in terms of relative advantage

INDICATORS	WEIGHTED MEAN	DESCRIPTIVE RATING
Iron Fortified Rice can totally aid back the iron nutrient compared to the other fortified products.	4.76	Very High
Iron Fortified Rice is highly nutritious than other rice varieties.	4.70	Very High
Iron Fortified Rice provides a good source of iron nutrients than other food products.	4.70	Very High
Iron Fortified Rice are adequately healthy for all ages than other fortified products.	4.68	Very High
Iron Fortified Rice can help the iron-deficient individual as it is a source of iron.	4.56	Very High
Iron Fortified Rice is composed of essential micronutrient compared to the other rice varieties.	4.55	Very High
Iron Fortified Rice is a good quality of rice than other rice varieties.	4.46	High
Iron Fortified Rice is cheaper than other fortified products.	4.44	High
Iron Fortified Rice is more resistant to pests and other diseases than other milled rice.	4.01	High
OVERALL MEAN	4.54	Very High

Legend: 4.51-5.00 Very High 3.51-4.50 High 2.51-3.50 Moderate 1.51-2.50 Low 1.00-1.50 Very Low

Compatibility. Table 7 presents the perception of participants towards Iron iron-fortified Rice in terms of compatibility with an overall mean of 4.25, which indicates high. The result shows that iron-fortified Rice tasted good, like any other rice (4.15). Iron-fortified Rice is easy to cook just like any other rice. (4.77) Iron Fortified Rice smells good when cooked like any other rice (4.30). However, the statement that iron-fortified rice is composed of white grains, just like any other rice (1.91), is low. This means that the participants find iron-fortified rice compatible with ordinary rice; however, when it comes to its color pigmentation, it is contrary to the color of commercial milled rice. According to Joe's AdBlog (2008), innovation is deemed highly compatible with the consumer when the product or service aligns closely with the individual's needs, desires, beliefs, values, and consumption patterns.

Table 7. Perception towards Iron Fortified Rice (IFR) among the participants in terms of compatibility

INDICATORS	WEIGHTED MEAN	DESCRIPTIVE RATING
Iron Fortified Rice is easy to cooked just like any other rice.	4.77	Very High
Iron Fortified Rice is not sticky when cooked just like any other rice.	4.62	Very High
Iron Fortified Rice does not spoiled easily just like any other rice.	4.56	Very High
Iron Fortified Rice have a similar appearance same as the other rice.	4.55	Very High
Iron Fortified Rice is acceptable to the existent tradition and beliefs of the pregnant mothers.	4.55	Very High
Iron Fortified Rice is acceptable to the existent tradition and beliefs of the lactating mothers.	4.55	Very High
Iron Fortified Rice is exact to the existing values and experience of the pregnant mothers.	4.49	High
Iron Fortified Rice is exact to the existing values and experience of the lactating mothers.	4.49	High
Iron Fortified Rice smells good when cooked just like any other rice.	4.30	High
Iron Fortified Rice tasted good just like any other rice.	4.15	High
Iron Fortified Rice is softer in texture just like any other rice.	4.06	High
Iron Fortified Rice is composed of white grains just like any other rice.	1.91	Low
OVERALL MEAN	4.25	High

Legend: 4.51-5.00 Very High 3.51-4.50 High 2.51-3.50 Moderate 1.51-2.50 Low 1.00-1.50 Very Low

Complexity. Table 8 presents participants' perception of iron-fortified rice in terms of complexity, with an overall mean of 3.34, which indicates moderate. The result shows that when washed, Iron fortified rice produces yellow-colored water that requires thorough rinsing before cooking, as compared to commercial Rice (3.01). Iron Fortified Rice smells like rust and needs to be washed thoroughly to reduce the odor before cooking (2.93). However, in particular, participants exhibited high based on the statement that Fortified Rice has a dull yellow color compared to commercial Rice, affecting their sensory acceptance (4.16), and it has broken rice grains, similar to ordinary NFA rice, which can hardly be sold in the marketplace as a source of income (3.71). If the innovation has a high level of complexity, it will have a lower level of adoption (Joe's AdBlog, 2008). This implies that participants perceived Iron Fortified Rice as the least complex. According to Experts (2022), the higher the complexity, the longer it will take an individual to make an informed decision about the new product.

Table 8. Perception towards Iron Fortified Rice (IFR) among the participants in terms of complexity

INDICATORS	WEIGHTED MEAN	DESCRIPTIVE RATING
Iron Fortified Rice have a dull yellow color compared to commercial rice, affecting our sensory of acceptance.	4.16	High
Iron Fortified Rice has broken rice grains, similar to ordinary NFA rice, which can hardly be sold in the marketplace as a source of income.	3.71	High
Iron Fortified Rice is more expensive to purchase than other rice varieties because it costs more than the regular milled rice.	3.46	Moderate
When washed, iron fortified rice produces yellow-colored water that requires thorough rinsing before cooking, as compared to commercial rice.	3.01	Moderate
Iron Fortified Rice smells like rust and needs to be washed thoroughly to reduce the odor before cooking.	2.93	Moderate
Iron Fortified Rice requires months of consumption to effectively reduce iron deficiency anemia.	2.76	Moderate
OVERALL MEAN	3.34	Moderate

Legend: 4.51-5.00 Very High 3.51-4.50 High 2.51-3.50 Moderate 1.51-2.50 Low 1.00-1.50 Very Low

Observability. Table 10 presents participants' perception of Iron Fortified Rice in terms of observability with an overall mean of 4.65, which indicates very high. Result shows that Iron iron-fortified rice meets the demand of anemic pregnant and lactating mothers (4.68), Iron iron-fortified rice increases the awareness of pregnant and lactating mothers in preventing iron deficiency (4.68), Iron iron-fortified rice is not yet available in other markets (4.59). It can be totally consumed by anyone (4.82).

Table 10. Perception towards Iron Fortified Rice (IFR) among the participants in terms of observability

INDICATORS	WEIGHTED MEAN	DESCRIPTIVE RATING
Iron Fortified Rice can be totally consumed by anyone.	4.82	Very High
Iron Fortified Rice increases the awareness of the pregnant and lactating mothers in preventing iron deficiency.	4.68	Very High
Iron Fortified Rice meets the demand of the anemic pregnant mothers.	4.68	Very High
Iron Fortified Rice meets the demand of the anemic lactating mothers.	4.68	Very High
Iron Fortified Rice is not sellable in the marketplace because it's not yet well-known.	4.61	Very High

Iron Fortified Rice is not yet available to other markets.	4.59	Very High
Iron Fortified Rice reduces the prevalence incidence of Iron deficiency anemia among the pregnant and lactating mothers.	4.49	High
OVERALL MEAN	4.65	Very High

Legend: 4.51-5.00 Very High 3.51-4.50 High 2.51-3.50 Moderate 1.51-2.50 Low 1.00-1.50 Very Low

This implies that participants perceived Iron Fortified Rice as observable. Calleja (2023) mentioned that observability gives everyone a common vocabulary and comprehension of the product and how it works. It enables them to stay focused on the product's objectives and make well-informed judgments. Thus, observability ensures that all stakeholders have a shared understanding of the product's functioning, leading to improved efficiency and effectiveness in product development and usage. Maximizing product productivity and ultimately delivering more reliable resources is empowered by observability (Mireles, 2024).

Trialability. Table 11 presents participants' perception of Iron Fortified Rice regarding trialability with an overall mean of 4.37, which indicates high. The result shows that Iron Fortified Rice can be tried in both modern and traditional methods of cooking (4.77), Iron Fortified Rice can be fed to babies (4.43), Iron Fortified Rice can be tried by elderly individuals (4.38), and Iron Fortified Rice can be tried with less cost and expenses on a daily basis (4.32). On the other hand, participants moderately responded to the statement that iron-fortified Rice can be used for small and large-scale food chains (3.41). This implies that participants perceived Iron iron-fortified rice as highly trialable compared to other rice varieties. Robinson (2009) states that a trialable innovation lessens uncertainty for the person considering implementing it.

Table 11. Perception towards Iron Fortified Rice (IFR) among the participants in terms of trialability

INDICATORS	WEIGHTED MEAN	DESCRIPTIVE RATING
Iron Fortified Rice can be tried in both modern and traditional method of cooking.	4.77	Very High
Iron Fortified Rice can be tried on person with disabilities.	4.66	Very High
Iron Fortified Rice can be tried regardless of the social status of individual.	4.60	Very High
Iron Fortified Rice can be tried on morbid individual.	4.48	High
Iron Fortified Rice can be fed on babies.	4.43	High
Iron Fortified Rice can be tried by elder individuals.	4.38	High
Iron Fortified Rice can be tried on Covid-19 patients.	4.32	High
Iron Fortified Rice can be tried with less cost and expenses on daily basis.	4.32	High
Iron Fortified Rice can be used for small and large scale of food chain.	3.41	Moderate
OVERALL MEAN	4.37	High

Legend: 4.51-5.00 Very High 3.51-4.50 High 2.51-3.50 Moderate 1.51-2.50 Low 1.00-1.50 Very Low

CONCLUSION

In light of the above findings, the following conclusions were forwarded:

Participants were middle-aged, married, with average household size, and attained secondary level of education, migrants from Visayas, Roman Catholic, private employees, have low annual income and have no agricultural land and land control. They prefer to an easy way, interacted the change agent, have different sources of information, and lack training and seminars. Participants have positive attitude towards the Iron Fortified Rice and aspire for the betterment of the family.

Participants perceived the Iron Fortified Rice (IFR) relatively advantageous, observable, compatible and trialable, and moderately complex.

Top four (4) problems encountered by the participants on Iron Fortified Rice included lack of knowledge about iron fortified rice, iron fortified rice was yellowish, similar appearance to NFA rice, and lack of training and seminars.

RECOMMENDATIONS

Based on the findings the following recommendations were forwarded:

Given the demographic profile of the participants, who are predominantly middle-aged, married individuals with secondary education and low income, the study may suggest that interventions should focus on addressing their socio-economic challenges. Initiatives could include vocational training programs aimed at enhancing employability and income generated opportunities, particularly for migrants from Visayas who lack agricultural land and land control. Collaboration with local organizations and government agencies can facilitate the delivery of tailored support services to empower participants economically. The efforts to increase financial literacy and promote responsible borrowing practices are recommended. Considering the participants interactions with change agents, the study may suggest that community-based education and outreach programs could be expanded. Offering accessible learning opportunities while collaborating with the local organizations should be enhanced to encourage participation specifically on promoting nutritional awareness that encourage the adoption of nutritious food choices within the community.

This study suggests focusing on strategies that enhance these positive perceptions while addressing the moderate complexity. This can be achieved by organizing community demonstrations and tasting events where participants can observe and try IFR firsthand, thus reinforcing its advantages and compatibility with their dietary habits. Additionally, providing simple, clear instructions on how to cook and incorporate IFR into daily meals can help mitigate the perceived complexity. Educational campaigns should emphasize the health benefits of IFR, particularly its role in combating iron deficiency, to further encourage its adoption.

The study may suggest that local health authorities should implement target educational campaigns to promote the adoption of IFR extended to another locality, this factor may help raising awareness among other individual suffering from iron deficiency. This may determine their different perception thus, evaluating the various attitudes of individual towards IFR. These health initiatives interventions can further promote the quality of rice acceptance and the adoption among the target population.

Furthermore, the study suggest that DOST-Food and Nutrition Research Institute (DOST-FNRI) may undergo some analysis on how they can improve the color pigmentation and the smell of rice as it highly affects the sensory of acceptance to the consumers. There may be a need to improve dissemination of information among the community health workers towards the distinct characteristics of Iron Fortified Rice while collaborating with the local health authorities and nutrition experts. Using the mass media in all social platform to disseminate information about the Iron Fortified Rice to influence the people through.The findings of this study on the perception towards iron-fortified rice among pregnant and lactating mothers in selected barangays of Maramag, Bukidnon, have significant implications for public health policymakers and nutrition programs. By understanding the factors influencing these mothers' perceptions and their acceptance of iron-fortified rice, policymakers can develop targeted nutrition interventions and allocate resources more effectively to combat iron deficiency. Additionally, further research into the relationships between personal, socioeconomic, cultural, and health-related factors can provide deeper insights into mothers' decision-making processes and inform the development of more effective and tailored strategies to improve maternal and infant health outcomes through the consumption of iron-fortified rice. The country the unique beneficial aspect of the rice. Patronizing the people on how highly nutritious it is as an alternative iron supplement to decrease the prevalence incidence of Iron deficiency leading to anemia.

ACKNOWLEDGEMENTS

Sincere gratitude is expressed to her thesis adviser, Ms. Anecil S. Quijano-Pagutayao, for meticulously providing guidance, constructive feedback, and empowering encouragement to make the study successful. The author also extends her thanks to Ms. Madelon A. Boiser, Dr. Maryjoy S. Bacus, Ms. Angel Rose C. Tamayo, and Dr. Judith D. Intong for sharing their thoughts and comments that pave the way for the improvement of the manuscript. A heartfelt appreciation is extended to her family, especially Mama Marivic and Papa Arnel, for their unwavering support, abundant provision, and countless sacrifices. Their endless moral, financial, and spiritual support has been invaluable. Special thanks to all her friends who have been consistently stood by her through ups and downs, consoling and inspiring her and instilling a sense of diligence in her study. They are the precious people who played a vital role behind the author's successful study.

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