Naturally Formulated Chicken Feeds for Sustainable Poultry Farming in Iligan City, Philippines

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ABSTRACT

Naturally Formulated Chicken Feeds for Sustainable Poultry Farming in Iligan City, Philippines, aimed to examine the views of poultry farmers and feed suppliers regarding the potential transition to naturally formulated chicken feeds for sustainable poultry farming. Specifically, it sought to (1) identify current feeding practices, (2) determine challenges faced with commercial feeds, and (3) assess the willingness to adopt naturally formulated feeds. Using a qualitative research design, purposive sampling was employed in the conduct of the study, involving five (5) poultry raisers and five (5) feed sellers residing in Iligan City, Philippines. Semi-structured interviews were conducted, and the responses were analyzed through thematic analysis. Findings revealed that while commercial feeds are favored during the early growth stages for their convenience and balanced nutrition, rising costs significantly affect profitability, especially among small-scale farmers. As a cost-cutting measure, some farmers have shifted to homemade feeds using locally available ingredients such as corn bran, rice bran, soybean meal, and fishmeal. However, there is a need for accurate formulation to meet poultry nutritional requirements. Both farmers and feed suppliers expressed openness to using and providing plant-based or vegetative-based feeds, recognizing their potential to reduce dependency on expensive commercial options and to support environmentally sustainable farming. In conclusion, there is a strong interest in formulating and adopting naturally derived chicken feeds that are economically viable and nutritionally adequate. It is recommended that training and support be provided through community extension programs to guide local stakeholders in developing scientifically formulated, vegetative feed alternatives.

Keywords: naturally formulated chicken feeds, sustainable poultry farming, poultry raisers, feed sellers

INTRODUCTION

Poultry farming plays a vital role in ensuring global food security and fostering economic growth, especially in low- and middle-income countries. By 2025, it is anticipated that global poultry consumption will increase by 2.5% to 3%, fueled by its lower cost relative to other types of animal protein and rising demand in developing markets. In the Philippines, poultry farming plays a vital role in ensuring food security and generating income for numerous community raisers and vendors (Department of Agriculture, 2021). A key element affecting poultry production is the quality and affordability of feed, which represents a large share of operating costs (Wongnaa et al., 2023). Many farmers rely on commercially produced feeds due to their ease of use and consistent nutritional value (Akintan et al., 2024). Nevertheless, small-scale poultry producers frequently encounter issues such as rising feed prices, unreliable supply, and worries about the nutritional sufficiency of these feeds. These obstacles have led to the investigation of alternative, sustainable, and locally sourced feed options (Wongtangtintharn et al., 2025).

Vegetative-based feeds incorporating other organic ingredients provide an affordable and environmentally friendly option for small-scale poultry farmers (Bist et al., 2024). In Surigao del Sur, Philippines, the Special Area for Agricultural Development (DA-SAAD) program from the Department of Agriculture instructed farmers on how to create affordable poultry feeds utilizing local resources such as water hyacinth, ramie, and rice bran, which helps lessen dependence on costly commercial feeds (Malingan, 2025). In a similar manner, an article published in Frontiers in Veterinary Science (2023) examined the potential of pumpkin and garden cress seeds as supplements in animal feed. These seeds are abundant in essential fatty acids, proteins, and antioxidants. The research revealed that including up to 20% pumpkin seed meal in the diets of broilers led to improved growth performance without any adverse effects. Likewise, the addition of 0.75% garden cress resulted in increased feed intake, body weight, and overall health (El-Sabrout et al., 2023).

In addition to their economic advantages, vegetative feeds play a crucial role in environmental sustainability by reducing waste and encouraging the repurposing of agricultural byproducts. Integrated farming systems illustrate this beneficial relationship, where vegetable leftovers are used as poultry feed, and poultry manure is utilized to fertilize vegetable crops, thereby improving production for both crops and livestock (Atapattu et al.,2025).

Even with these benefits, the use of vegetative feeds by local poultry farmers and vendors is still restricted, frequently because of insufficient awareness, expertise, and resource availability. It is crucial to comprehend the community's views, requirements, and acceptance regarding vegetative chicken feeds to create effective extension programs that promote sustainable feeding methods.

This research intends to evaluate the existing feeds, difficulties, and willingness of poultry farmers and feed sellers to switch to naturally formulated feeds, such as vegetative plant feed supplemented with other organic ingredients. By gaining insights into these elements, the research aims to guide the creation of specialized extension programs that promote the use of sustainable and economical feeding methods among community poultry raisers and sellers.

Additionally, this initiative is in line with Sustainable Development Goal (SDG) 12: Responsible Consumption and Production, which highlights the significance of sustainably managing and efficiently utilizing natural resources. By promoting the usage of locally sourced vegetative feeds, the project helps minimize environmental impact, fosters sustainable agricultural practices, and advances the overall goals of sustainable development in the Philippines.

METHODOLOGY

This research utilized a qualitative design to investigate the views, experiences, and obstacles faced by community poultry raisers and feed sellers concerning the use of commercial feeds and vegetative-based chicken feed. The qualitative method is selected due to its ability to effectively convey the richness and intricacy of the participants' viewpoints, especially in agricultural settings where socio-cultural factors are influential. Qualitative research holds significant importance in agriculture as it reveals the complex human elements present within agricultural systems, providing a more profound understanding of farmers' decision-making processes and the interactions within communities (Rosairo,2024).

Area of study

The study was conducted in Iligan City, a highly urbanized city located on the northeastern coast of Northern Mindanao, Philippines, specifically in the province of Lanao del Norte. It is a coastal city on the western side of Mindanao, facing Iligan Bay. Misamis Oriental bounds the city to the north, Bukidnon and Lanao del Sur to the east, and Lanao del Norte to the south. Iligan City is ideally located for a feed formulation study because of its available local raw materials, such as agricultural by-products. The city also features a growing livestock and poultry sector that can take advantage of economically feasible, well-balanced, and locally sourced feeds. Furthermore, Iligan’s closeness to farming and coastal communities provides a chance to tackle environmental issues by transforming organic waste into valuable animal feed, thus promoting sustainability and economic growth.

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Data Collection

In carrying out the research, the researcher used semi-structured interviews to obtain detailed insights from poultry farmers and feed vendors in Iligan City. This method allowed for an in-depth investigation of participants' experiences, difficulties, and viewpoints concerning the use of commercial feeds versus naturally formulated chicken feeds made from vegetative plants and enhanced with organic ingredients. To maintain consistency throughout the interviews while still allowing for the exploration of unique perspectives, an interview guide containing open-ended questions was used. This approach enabled the researcher to keep a structured framework for gathering data while also offering the flexibility to explore specific topics relevant to each participant. By utilizing this qualitative methodology, the study sought to capture the intricate understandings and practices of those directly engaged in poultry feed utilization within the local setting.

Sampling Procedure

Purposive sampling, a non-probability sampling technique, was used to intentionally select participants who met specific criteria relevant to the study. The criteria for inclusion were as follows: for the poultry raisers: 1) the participants are actively engaged in poultry farming, 2) the participants should have at least one year of experience in poultry farming to provide informed insights, and 3) the participants expressed a willingness to participate in interviews. For the feed sellers: 1) the participant must operate as feed suppliers or distributors within Iligan City, 2) the participants must offer commercial poultry feeds, and 3) the participants must have a minimum of one year of experience in the feed supply business to ensure familiarity with market trends and customer needs.

The researchers initially selected ten participants (5 poultry raisers; 5 feed sellers) who met the inclusion criteria. By choosing participants that fit these specific criteria, the study sought to collect comprehensive, detailed information that could guide the creation of focused extension programs aimed at sustainable poultry feeding practices.

Purposive sampling, referred to as judgmental sampling, entails deliberately choosing participants based on particular traits pertinent to the research inquiry. This method is especially useful in qualitative research, where the objective is to achieve a deep understanding from individuals who have first-hand experience of the phenomenon being examined. By choosing participants that fit these specific criteria, the study sought to collect comprehensive, detailed information that could guide the creation of focused extension programs aimed at sustainable poultry feeding practices.

By incorporating both poultry farmers and feed retailers, a thorough examination of the naturally formulated Chicken Feed market was achieved, covering everything from production to distribution. This combined viewpoint enabled a more profound insight into the various interconnected elements that affect the implementation and effectiveness of vegetative-based feeds within the regional poultry sector.

Analytical Techniques

In this study, qualitative data collected through semi-structured interviews with poultry farmers and feed sellers were analyzed using thematic analysis. Semi-structured interviews provided a guided yet flexible format, enabling consistent data collection while allowing for deeper exploration of emerging themes (Mashuri et al., 2022). Thematic analysis facilitated the systematic interpretation of participant narratives by identifying recurring patterns, categories, and themes relevant to the study’s objectives. The analytical process followed six phases: (1) familiarization with the data, (2) generation of initial codes, (3) searching for themes, (4) reviewing themes, (5) defining and naming themes, and (6) producing the final report. This method allowed for a meaningful and nuanced understanding of participants' experiences, supporting the derivation of insights into feed practices and the potential adoption of naturally formulated chicken feeds.

Operational definitions of variables

Commercial feeds. Consists of blended rations designed for animal consumption, usually available for sale in the general market.

Naturally formulated chicken feeds. Feeds composed of locally available, unprocessed or minimally processed ingredients such as rice bran, potato leaves, moringa (malunggay) leaves, and other plant-based materials. These feeds are prepared without synthetic additives, antibiotics, or commercial premixes, aiming to provide essential nutrients for poultry growth.

Poultry Raisers. The respondents in the study were they who raise poultry in Iligan City.

Feed Sellers. The respondents in the study were they who sell commercial feeds in the market.

Sustainable Poultry Farming. It involves the cultivation of chickens in a way that is ecologically responsible, financially sustainable, and socially just.

RESULTS AND DISCUSSION

This research examined the views and experiences of poultry farmers and feed vendors in Iligan City concerning commercially manufactured feeds and the possible shift towards plant-based alternatives. The results are structured based on the main themes identified from the questionnaire and participant feedback.

On the poultry raisers:

What types of feeds do you currently use for your poultry?

Table 1. Type of Feeds Used by Poultry Raisers

Themes	Code	Coded Responses
Types of feed used	Commercial feeds	I use well-known commercial feeds for the initial growth phases of chicks. These feeds are preferred because they offer ease of use and consistent nutrient composition, promoting swift growth and boosting immunity.
	Alternative Feeds	I am using corn bran as an alternative to traditional feed to reduce expenses.

In the early phases of chick development, numerous raisers chose popular commercial feeds as stated in Table 1." *I use well-known commercial feeds for the initial growth phases of chicks. These feeds are preferred because they offer ease of use and consistent nutrient composition, promoting swift growth and boosting immunity"*. These feeds were preferred for their practicality and reliable nutrient composition, which promote quick growth and enhance the immune system. Commercial feeds are designed to fulfill the specific nutritional needs of chicks, guaranteeing optimal development during this vital stage. Utilizing these feeds is consistent with optimal approaches in poultry nutrition, as initiating feeding early is essential for the growth of the gastrointestinal system and immune-related organs, resulting in improved growth performance and health conditions in chickens (Vlaicu et al., 2024). As the chicks grow older, many farmers switch to custom-made feeds that use locally available components like corn bran, rice bran, soybean meal, and fishmeal, as mentioned in the table "*I am using corn bran as an alternative to traditional feed to reduce expenses"*. This method not only reduces costs but also offers the flexibility to modify the feed mixture according to the availability of ingredients. Formulating feeds on the farm is one of the best ways to maintain quality and cut production costs (Sikorska, 2023). Nonetheless, it is crucial to guarantee that these homemade feeds fulfill the nutritional requirements of the poultry to support their health and productivity. Creating and blending poultry feed is a complicated procedure that guarantees the diet includes all the necessary nutrients for the poultry.

How satisfied are you with the performance and results of commercial feeds in terms of nutritional value, economic value, and efficiency?

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Table 2. Customer Satisfaction with Commercial Feeds

Theme 2	Code	Coded Responses
Customer Satisfaction with Commercial Feeds	Satisfaction	*I am pleased with how commercial poultry feeds perform, as they are designed based on scientific research to fulfill the nutritional needs of poultry at different stages of growth.*

On the satisfaction of commercial feeds, consumers stated, *"I am pleased with how commercial poultry feeds perform, as they are designed based on scientific research to fulfill the nutritional needs of poultry at different stages of growth,"* as seen in Table 2. Commercial feeds offer a well-rounded combination of proteins, fats, vitamins, and minerals, which support the flock's optimal growth, health, and productivity. The addition of ingredients like enzymes and probiotics boosts nutrient absorption and strengthens disease resistance, leading to better performance of the overall flock. *Nonetheless, the rising expenses of commercial feed pose a considerable obstacle to the sustainability of depending exclusively on them.* For small-scale poultry producers, particularly in areas such as Iligan City, the elevated costs can burden financial resources and diminish profit margins. This financial strain compels the investigation of alternative feeding methods that ensure nutritional quality while remaining economical.

One effective strategy is to combine locally sourced feed ingredients to create home-mixed diets. Using agricultural by-products like rice bran, corn bran, and soybean meal can lessen reliance on commercial feeds.

What are your common concerns/challenges regarding commercially available feeds?

Table 3. Challenges of Commercially Available Feeds

Theme 3	Code	Coded Responses
Challenges of Commercially Available Feeds	Expensive	Feed for chickens is expensive, even for pigs
		The price per kilo of feed is high.

A significant worry for poultry farmers is the rising expense of commercial feed. As one participant pointed out, "*Feed for chickens is expensive, even for pigs*,". Another consumer said," The price per kilo of feeds is high," based on Table 3, emphasizing the financial burden created by high feed costs. This problem is especially critical for small-scale farmers who might find it challenging to purchase the required amounts of commercial feed to maintain their flocks. The increasing expenses are linked to reasons like heightened demand for feed components, disruptions in the supply chain, and changes in the global economy (Janberg, 2025).

Have you tried using plant-based feeds? If yes, what are your experiences with its usage?

Table 4. Acceptability and Experiences of Users of Vegetative-Based Feeds

Theme 4	Code	Coded Responses
Acceptability and Experiences of Users on Vegetative-Based Feeds	Acceptability and Experiences	*I have integrated plant-based feeds into my poultry management practices, using locally sourced ingredients like corn bran.*

Based on Table 4, one of the participants said, *"I have integrated vegetative-based feeds into my poultry management practices, using locally sourced ingredients like corn bran"*. As a byproduct of corn milling, corn bran provides specific nutritional benefits, featuring an average crude protein level of about 11.9% and a crude fiber content of roughly 12.3% on a dry matter basis. These qualities render it a significant energy source and enhance dietary fiber in poultry nutrition. Relying solely on corn bran does not guarantee optimal growth and health in poultry. A key drawback is its elevated fiber content, which can hinder nutrient digestion and feed efficiency in monogastric animals such as chickens. Furthermore, corn bran lacks essential amino acids like lysine and methionine, vital for muscle development and overall growth (poultryfeedformulation,2023). To overcome these shortcomings, it is essential to complement corn bran with other protein-rich sources like soybean meals or fishmeal to create a well-rounded diet. Additionally, corn bran is prone to contamination by mycotoxins, especially aflatoxins and fumonisins, which can negatively impact the health and performance of poultry (Nsiah et al., 2023). Consequently, it is crucial to implement appropriate storage and handling procedures to reduce these risks.

If you are introduced to organically made animal feed, would you be willing to use them? Why?

Table 5. Feasibility of vegetative-based Chicken Feeds

Theme 5	Code	Coded Responses
Feasibility of Natural Formulated Chicken Feeds	Feasibility	*I would be open to using organically produced animal feed, as long as it is nutritionally balanced, affordable, and easily accessible.*

Participants were asked about their willingness to use naturally formulated chicken feeds and mentioned, "I would be open to using organically produced animal feed, as long as it is nutritionally balanced, affordable, and easily accessible," as seen in Table 5. Organic feeds provide numerous advantages. They contain no synthetic additives, pesticides, or genetically modified organisms (GMOs), which can result in healthier birds and may yield meat and eggs with greater nutritional benefits. For instance, a study by Wickramasuriya et al. (2023) found that supplementing broiler diets with organic selenium improved gut health and bolstered immune responses against coccidiosis, leading to better growth performance. Furthermore, organic farming methods frequently enhance animal welfare by offering superior housing environments and access to outdoor areas, which can lessen stress and boost overall well-being.

Utilizing locally sourced plant-based ingredients like sweet potatoes, azolla, and taro leaves in poultry feed can help to lower expenses and promote sustainable farming methods. Leaves and vines of sweet potatoes are rich in crude protein (25–29%) and essential amino acids, including methionine and lysine. They act as a cost-effective and nutritious feed option, especially in regions where traditional protein sources are limited (Muleta, 2024). Azolla, a tiny aquatic fern, is abundant in protein, vitamins, and minerals. It can be easily grown in small bodies of water and acts as an affordable feed supplement for poultry, enhancing their growth and productivity (Tababa, 2023). Taro leaves are rich in protein, carotene, and essential trace minerals. They serve as an economical and nutrient-dense feed option, particularly beneficial in areas where traditional feed sources are costly or scarce (Muleta, 2024)

By using ingredients sourced from local farms, farmers can create affordable and nutritious food that adheres to organic farming standards. Additionally, this method promotes environmental sustainability by decreasing the dependence on imported feed ingredients and lowering the carbon footprint related to the production and transport of feed (Çakmakçı et al., 2023) Nevertheless, it is vital to take into account possible challenges, like maintaining consistent quality and availability of these ingredients, in addition to balancing nutrient profiles to satisfy the particular dietary requirements of poultry. Careful formulation and possibly seeking guidance from animal nutrition professionals can assist in tackling these issues.

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On the feed sellers:

What types of commercial poultry feeds do you offer?

Table 6. Types of commercial poultry feeds offered

Theme 1	Code	Coded Responses
Types of commercial poultry feeds offered	Types	*I provide a wide variety of poultry feeds designed to address the unique nutritional needs of birds throughout their growth phases and production cycles. These feeds come in various types and forms to accommodate the different requirements of poultry, such as starter, grower, and finisher feeds.*

Based on Table 6, the types of feeds offered by the feed sellers are commercial feeds, as they stated, *"I provide a wide variety of poultry feeds designed to address the unique nutritional needs of birds throughout their growth phases and production cycles. These feeds come in various types and forms to accommodate the different requirements of poultry, such as starter, grower, and finisher feeds".*

Starter feeds are designed for chicks from their first day until they reach approximately six weeks old. These feeds contain a high protein content (usually between 20–24%) to promote quick growth and are commonly offered in mash or crumble forms to facilitate easy eating by young chicks. Grower feeds are appropriate for birds between the ages of six and twenty weeks, providing essential support for ongoing growth with a moderate protein level of approximately 16–18% and reduced calcium compared to layer feeds. They are generally available in the form of pellets or crumbles. Finisher feeds are utilized in the final weeks prior to processing meat birds. They aim to encourage healthy weight gain while minimizing excess fat, resulting in leaner and more flavorful meat. Usually, finisher feed contains approximately 15–18% protein and is enriched with energy from fats and carbohydrates to facilitate swift weight gain during this last stage. It is generally provided in pellet form, which is more manageable for larger meat birds to eat.

If there are available Naturally Formulated Chicken feeds for sale, would you be willing to sell them?

Table 7. Willingness to sell Naturally Formulated Chicken Feeds

Theme 2	Code	Coded Responses
Willingness to sell Naturally Formulated Chicken Feeds	Willingness	*Yes, I would be open to selling plant-based poultry feeds if they become accessible. The interest in sustainable and environmentally-friendly farming methods is on the rise, and plant-based feeds are a good fit for these movements. They provide advantages like a lower environmental footprint and possible savings on costs.*

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As seen on Table 7, the feed sellers were asked about their willingness to sell naturally formulated feeds and said *"Yes, I would be open to selling naturally Formulated Chicken feed and poultry feeds if they become accessible"*. The interest in sustainable and environmentally-friendly farming methods is on the rise, and plant-based feeds are a good fit for these movements. They provide advantages like a lower environmental footprint and possible savings on costs. For example, protein isolates derived from plants such as soy and pea offer excellent digestibility and contain essential amino acids, which promote the health and growth of livestock. The worldwide market for plant-based protein isolates in animal feed is expected to hit USD 3.54 billion by 2030, reflecting substantial growth and uptake in the sector (Hertzler et al., 2020).

Additionally, shoppers are showing a growing interest in poultry products from birds that are fed vegetarian-based diets, viewing these as healthier choices. This change in consumer behavior creates a chance to distinguish my products in the marketplace. By using plant-based feeds, I can serve this developing market segment and support more sustainable methods in poultry farming (Evolve Business Intelligence, 2024).

Furthermore, using vegetative-based feeds can lessen reliance on conventional animal-derived inputs, which frequently face price fluctuations and supply chain issues. This can result in more consistent profit margins and a more robust farming enterprise. In summary, providing plant-based poultry feeds is in line with prevailing market trends and consumer demands, offering possible advantages regarding sustainability, cost efficiency, and product differentiation.

CONCLUSION

The qualitative information obtained from poultry farmers and feed sellers in Iligan City revealed an intricate understanding of prevailing feeding methods, obstacles, and receptiveness to alternative options. Farmers mainly depend on commercial feeds in the initial growth phases of poultry because these provide reliable nutritional profiles that facilitate optimal growth. Nevertheless, the rising expenses linked to these feeds created considerable financial strain, especially for small-scale producers. This economic pressure has prompted some farmers to investigate locally available, naturally formulated chicken feeds incorporating vegetative plant formulas such as corn bran, rice bran, and soybean meal. Although these alternatives present cost advantages, worries about their nutritional adequacy and possible contaminants, like mycotoxins, demand meticulous formulation and handling. Feed vendors have shown readiness to provide plant-based feeds, acknowledging an increasing market demand for sustainable and health-oriented poultry products. The ability of vegetative-based feeds to diminish environmental impact and resonate with consumer preferences offers an encouraging opportunity for market differentiation and sustainability. These insights highlight the necessity of establishing community extension initiatives aimed at educating farmers on creating nutritionally balanced, vegetative-based diets, as well as enforcing quality control practices. Such programs can empower farmers to embrace sustainable feeding methods that are economically feasible and environmentally sound, aligning with broader objectives of food security and sustainable agriculture.

RECOMMENDATIONS

Based on the results of the study and the broader context of poultry feeding practices in Iligan City, Philippines, the following suggestions are made to assist in the shift towards naturally formulated, plant-based chicken feeds:

To begin with, it is important to launch community-driven training sessions that emphasize feed formulation and safety. Partnering with local organizations such as the Agricultural Training Institute (ATI) and the Iligan City Agriculture Office can aid in creating and providing these sessions. The training should cover how to formulate nutritionally balanced plant-based feeds utilizing local resources like corn bran, rice bran, and soybean meal. Additionally, teaching farmers how to recognize and address risks associated with mycotoxin contamination, which is common in Southeast Asia and can pose significant health hazards to poultry, is essential. It is also important to stress proper storage techniques that prevent the growth of fungi and the production of mycotoxins.

Moreover, it is advised to cultivate a local supply chain for feed ingredients. Supporting the growing and processing of feed ingredients locally can lower costs and enhance quality. Encouraging farmers to plant crops like corn and soybeans suitable for feed production and fostering collaborations between farmers and feed manufacturers can establish a sustainable supply chain.

Finally, initiating public awareness campaigns regarding sustainable poultry products can boost consumer interest. Implementing marketing strategies that inform consumers about the advantages of poultry raised on natural, plant-based feeds can emphasize the health and environmental benefits of sustainable poultry farming. Such campaigns can generate market demand that motivates farmers to adopt natural feeding practices.

By focusing on these aspects, stakeholders in Iligan City can collaboratively tackle the challenges linked to transitioning to naturally formulated chicken feeds, ensuring the economic viability, food safety, and environmental sustainability of poultry farming.

Ethical Considerations

As part of the ethical consideration in the conduct of the study, the researchers respect the dignity of the research participants and were asked for their full informed consent. Informed consent is specifically written for the interview and observation process prior to the data gathering process. The informed consent was given to the participants signed by the adviser, the Chairperson, and the Dean of the College of Education. Participants were informed that their participation in the research was voluntary and are free to ask questions for any concerns. Participants were informed that any information they provided was kept confidential and that their identities were not revealed in association with the information they provided. The respondent's privacy and their responses were not individually analyzed and included in the report as the confidentiality of the information supplied by research subjects and the anonymity of respondents was respected by the researcher.

Conflicts of Interest

The authors declare no conflict of interest.

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