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BEYOND THE STALL: PERCEPTION, HYGIENIC PRACTICES, AND PREVALENCE RATE OF SKIN CONDITIONS AMONG MEAT AND FISH VENDORS IN SAN FERNANDO PUBLIC MARKETS

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ABSTRACT

Meat and fish vendors in wet public markets are frequently exposed to wet work, raw animal products, and prolonged working hours, increasing their risk of occupational skin conditions. This study aimed to determine the prevalence of skin conditions among meat and fish vendors in the Old and New San Fernando Public Markets and examine the relationships among their perception of preventive measures, hygienic practices, and prevalence of skin conditions. A quantitative, descriptive-correlational cross-sectional design was employed among 152 vendors selected through purposive sampling. The study was completed in May 2026. Data were collected using a researcher-made questionnaire adapted from the Occupational Skin Diseases Exposure Scales (OSDES-16) and analyzed using frequency, percentage, prevalence, weighted mean, standard deviation, and Pearson product-moment correlation at a 0.05 level of significance. Results showed that lichenification or skin thickening had the highest self-reported prevalence (63.8%), followed by dryness and itching (63.2%). Respondents demonstrated a high level of perception of preventive measures ($M = 3.11$, $SD = 0.68$) and hygienic practices ($M = 2.84$, $SD = 0.63$). Significant positive relationships were found between skin-condition prevalence and preventive measures ($r = .252$, $p = .002$), skin-condition prevalence and hygienic practices ($r = .345$, $p < .001$), and hygienic practices and preventive measures ($r = .550$, $p < .001$). Skin conditions remain common despite high perception, highlighting the need for strengthened occupational health interventions and improved workplace conditions.

Keywords: *Vendors, Skin Conditions, Hygienic Practices, Prevalence, Perception, Preventive Measures*

INTRODUCTION

Occupational skin disease (OSD) is a major occupational health concern for workers who are frequently exposed to water, chemicals, biological agents, and unsanitary working conditions. One of its most common forms, irritant contact dermatitis, causes itching, redness, irritation, and skin lesions, and a systematic review of 48 studies found strong evidence linking it to wet work and to combined exposure to wet work and non-alcoholic disinfectants (Jacobsen et al., 2022). These conditions also affect a person's comfort and ability to work. Food handlers are particularly vulnerable because their work often requires frequent handwashing, prolonged exposure to water, and direct contact with raw animal products (Fernando & Thamilvannan, 2021; Schütte et al., 2023). This makes it important to examine how these risks affect meat and fish vendors, whose work combines wet conditions, raw animal products, and long working hours.

The Philippines is an archipelago, and livestock, poultry, and fisheries together accounted for 42.4% of the value of agricultural production in the first quarter of 2024 (Philippine Statistics Authority [PSA], 2024). For Filipinos, wet markets have long served as primary trading centers in towns across the country (Carmen et al., 2020), and small-scale fish vendors, for example, are important to food security and local livelihoods in coastal cities (Mangubat et al., 2025). San Fernando is the capital of Pampanga and the regional center of Central Luzon (City Government of San Fernando, n.d.). Its city center includes the Old and New Public Markets, where many meat and fish vendors make their living. These vendors spend several hours in wet environments and repeatedly handle raw animal products, blood, animal fluids, and surfaces that may not always be clean.

Studies abroad showed that this kind of work posed real risks to the skin. Wet work remains one of the most important occupational risk factors for occupational contact dermatitis, and prolonged water exposure, frequent handwashing, and repetitive contact with irritants all contribute to skin barrier damage, including among individuals exposed to food or animal products (Schütte et al., 2023). Johnson and Etokidem (2019) noted that butchers in Uyo, Nigeria, faced an elevated risk of skin allergies and dermatitis due to prolonged exposure to bacteria, fungi, and unsanitary conditions, amplified when personal protective equipment (PPE) was not used. Le et al. (2020) reported that 50.5% of seafood market workers in Ningbo, China, had hand dermatitis, and fungal infections were significantly higher among workers handling raw fish; they also identified prolonged wet work, lack of waterproof gloves, and working hours as associated factors. Similarly, Hadaye and Dey (2024) found that about half of the fisherwomen in Mumbai developed skin problems and infections from frequent contact with fish, ice, and watery conditions, and that they were more likely to develop dermatitis, fungal infections, and allergic reactions if they did not know how to care for their skin or did not wear protective gear. Fernando and Thamilvannan (2021) found that 42.3% of food handlers in Batticaloa, Sri Lanka, had occupational dermatoses, with irritant and allergic dermatitis being the most common. Hon et al. (2021) similarly observed that OSD was a common problem among

food processing workers, particularly in workplaces involving direct contact with wet and raw products; compared with bakery workers, meat processing workers were more likely to be exposed to wet work, use hand sanitizers more frequently, and change gloves more frequently. Together, these findings show that occupational exposure, particularly prolonged contact with moisture, may contribute to skin problems among workers handling animal and seafood products. However, these studies were conducted outside the Philippine setting and did not specifically examine the relationship between occupational skin conditions and hygienic practices among local market vendors.

Hygiene itself could add to the problem. Although proper handwashing is essential for hygiene and food safety, frequent handwashing with water, sanitizers, and other cleaning agents may damage the skin barrier and lead to contact dermatitis (Schütte et al., 2023). Jacobsen et al. (2022) found limited evidence linking occlusive gloves alone to irritant contact dermatitis, but moderate evidence when gloves were combined with other wet-work irritants, and noted that healing is poor unless exposure is reduced. Therefore, hand hygiene and food safety must be maintained while handlers are protected from occupational skin diseases through appropriate protective equipment and reduced exposure. GYMDA (2025) highlights that U.S. organizations, including the Food and Drug Administration (FDA) and the Occupational Safety and Health Administration (OSHA), mandate strict compliance with hygiene protocols and the use of sanitary protective clothing in food-handling and food-selling settings, and that food vendors and handlers must use PPE, such as gloves, masks, hairnets, aprons, and protective footwear, to uphold cleanliness and prevent contamination.

However, knowing what to do did not always translate into doing it. In a cross-sectional survey of 408 meat handlers in Bangladesh, Hasan et al. (2024) found that although 70.7% had “good” meat-hygiene knowledge and 53% had a positive attitude toward hygiene, only about 49.8% achieved “good” hygiene practices, indicating a significant discrepancy between knowledge-attitude and actual behavior. Kenaw et al. (2024), who examined meat-handling practices and microbial contamination in butcher shops in Hawassa City, Ethiopia, found that poor sanitation, sporadic disinfection, fly exposure, and poor personal hygiene were the main causes of widespread hygienic problems. Studies from Ethiopia (Kenaw et al., 2024), Nigeria (Fayemi et al., 2026), and Bangladesh (Hasan et al., 2024) collectively indicate that while vendors frequently have a basic understanding of food safety, implementation is hampered by gaps in sanitation infrastructure, a lack of training opportunities, and inconsistent use of PPE. Oliveira et al. (2024) found that most food handlers in butcher and fish merchant establishments possessed sufficient knowledge of hygiene and food safety regulations, largely due to hygiene training. However, some establishments lacked adequate infrastructure and resources for hygienic food preparation, compromising the safety of both vendors and consumers. Similarly, Henderson (2026) reported, based on a nationwide survey of more than 2,700 U.S. food handlers, that many demonstrated a strong understanding of handwashing, personal cleanliness, and illness reporting. The analysis emphasized the importance of food safety knowledge, ongoing reminders, continuous monitoring, and managerial training in maintaining proper worker practices and reducing illness transmission through contaminated food. Nevertheless, the study identified gaps in food handlers’ understanding of the causes of improper hygiene and food safety practices

during food preparation, which negatively influenced their behavior. Consequently, the authors underscored the need for regular health inspections and educational initiatives for business owners and workers, particularly in establishments handling refrigerated and perishable products.

Poor sanitation and unsafe handling also fueled microbial contamination. The spread of foodborne pathogens such as *Salmonella* and *Escherichia coli* is largely caused by poor sanitation, inadequate hygiene practices, contaminated equipment, and unsafe food-handling practices (Golden et al., 2021). Similarly, Nespolo (2021) emphasized that inadequate sanitation techniques and incorrect storage temperatures enable microorganisms to thrive and multiply in animal food products. Didier et al. (2021) found that inadequate handwashing during chicken preparation in domestic kitchens frequently resulted in cross-contamination, which supports these findings.

Philippine wet markets showed similar concerns. Basadre et al. (2025) found that fish vendors in Panabo City generally practiced appropriate food-handling behaviors but still had deficiencies in personal hygiene and sanitation, including the use of dirty aprons and limited access to clean water and cold storage. Bunzo and Simon (2026) reported generally satisfactory sanitation compliance among fish vendors in Baguio City despite gaps in waste management, drainage, facilities, and monitoring. Ciano (2025) emphasized the importance of proper hygiene in reducing *E. coli* contamination among pork retailers in La Trinidad, Benguet, while Aguanza and Magallanes (2024) identified high microbial loads on some food-contact surfaces in a Philippine wet market. Collectively, these recent studies show that hygiene, sanitation, facilities, and monitoring remain concerns in wet markets, and that working conditions in these settings remain a current concern. However, they primarily focus on food safety, microbial contamination, and sanitation rather than vendors' occupational skin health.

The health concerns of these vendors may also be overlooked, since workers in the informal sector, which the ASEAN guidelines describe as including food vendors and small-scale entrepreneurs, typically operate outside labor legislation, social protection, and occupational safety and health systems (ASEAN, 2026). Despite the growing literature on wet work, hygiene, and market sanitation, a research gap remained. Most existing studies focused on general food handlers, international populations, microbial contamination, and food safety procedures (Kenaw et al., 2024; Oliveira et al., 2024), and local studies focused mainly on food safety, sanitation, and microbial contamination (Basadre et al., 2025; Bunzo & Simon, 2026; Ciano, 2025), so information on the skin problems vendors experience remained limited. The prevalence of skin conditions among meat and fish vendors, and their perceptions of hygienic practices and preventive measures in local wet markets, were not well studied, and evidence from the Old and New San Fernando Public Markets was also limited. As a result, it remained unclear how hygienic practices and perceptions of preventive measures related to the occurrence of skin conditions among meat and fish vendors in Philippine public markets. This study differed from the available literature by focusing on meat and fish vendors in the Old and New San Fernando Public Markets. Therefore, the lack of localized evidence on the prevalence of skin conditions among meat and fish vendors, and on whether their

perception of hygienic practices and preventive measures was related to these conditions, constituted the research problem of this study.

Understanding this relationship was crucial because preventive behaviors, hygiene practices, and workplace conditions may also affect vendors' health; occupational exposure alone may not be sufficient to explain the skin problems vendors experience. Understanding vendors' hygienic practices, perception of skin health, and the occurrence of skin conditions can help identify where prevention and health education are needed. Determining the prevalence and common types of skin conditions among vendors can also serve as a foundation for appropriate occupational health interventions. To lower occupational risks among food handlers, prior research recommended health education, regular health inspections, appropriate use of PPE, better sanitation, and monitoring (GYMDA, 2025; Henderson, 2026; Oliveira et al., 2024). The study is therefore important for meat and fish vendors, future researchers, medical professionals, market administrators, and the Local Government Unit (LGU). It could raise vendors' awareness of the risks to their skin at work and promote the use of PPE and good hygiene. The results may be used as a basis for health education, medical examinations, hygienic practices, and suitable policies by the LGU and health professionals, and may add to the scant local literature on occupational skin conditions among market vendors and serve as a foundation for future research.

Therefore, this study, "Beyond the Stall: Perception, Hygienic Practices, and Prevalence Rate of Skin Conditions Among Meat and Fish Vendors in San Fernando Public Markets," aimed to determine the prevalence and most common kinds of skin conditions among meat and fish vendors in the Old and New San Fernando Public Markets and to examine the relationships among their perception of preventive measures, hygienic practices, and the prevalence of skin conditions. It also described the vendors' work profile and demographics, including their average working hours, age, sex, employment status, type of product handled, and work experience. By focusing on vendors in these two local markets, the study sought to provide context-specific information that could support safer working conditions and appropriate health promotion.

Research Objectives

This study aimed to determine the level of perception on preventive measures and hygienic practices of meat and fish vendors in Old and New San Fernando Public Markets and assess their relationship with the prevalence rate of skin conditions.

Specific Objectives:

1. Describe the demographic and work profile of the meat and fish vendors including their age, sex, employment status, type of product they handle, length of work experience, and average working hours.
2. Determine the prevalence rate and identify the most common types of skin conditions experienced by the public market vendors.
3. Assess the vendors' level of perception on preventive measures and hygienic practices.

4. Determine if a significant relationship exists between the vendors' level of perception on preventive measures and hygiene practices, and the prevalence rate of skin conditions.

Null Hypotheses:

There is no significant relationship between the meat and fish vendors' level of perception and hygienic practices, and the prevalence rate of skin conditions.

METHODOLOGY

Research Design

This study employed a quantitative, descriptive-correlational, cross-sectional research design to determine the prevalence of skin conditions among meat and fish vendors in the Old and New San Fernando Public Markets and to examine the relationships among their level of perception on preventive measures, hygienic practices, and the prevalence of skin conditions. The quantitative approach was used because the data were numerical, while the descriptive-correlational design described the variables and determined the relationships among them. Data were gathered at a single point in time, during March to April 2026.

Locale of the Study

The study was conducted in the Old and New San Fernando Public Markets in the City of San Fernando, Pampanga, Central Luzon, Philippines, which are among the region's largest trading centers and host many meat and fish vendors working in wet-market stalls.

Respondents and Sampling Method

The respondents were 152 meat and fish vendors from both markets, selected through purposive sampling, a non-probability technique in which participants are chosen because they meet the criteria of the study. The inclusion criteria were: (a) currently working as a fish and/or meat vendor in the San Fernando Public Markets, (b) at least four weeks of continuous work experience in the current occupation, and (c) aged 18–59 years. Vendors who declined to participate and senior citizens (aged 60 and above) were excluded. The demographic and work profile of the respondents is presented in Table 1 of the Results.

Research Instrument

Data were gathered using a researcher-made, 30-item questionnaire adapted from the Occupational Skin Diseases Exposure Scales (OSDES-16) by Drozdowska et al.

(2023). It was aligned with the study objectives, modified to suit the literacy levels of the respondents, and presented in English and Filipino. The questionnaire had three sections:

Section A (6 items) covered age, sex, employment status, type of product handled, length of work experience, and average daily working hours.

Section B (8 items) asked whether the respondent had experienced each of the following skin conditions in the past six months (Yes/No): redness, dryness, cracking, itching, blisters, burning or soreness, skin thickening (lichenification), and wounds or cuts that do not heal easily.

Section C (16 items) had two parts. The first measured the level of perception on preventive measures (5 items) on a four-point Likert scale (1 = Strongly Disagree to 4 = Strongly Agree), covering awareness of wet-work risks, the effect of wet or dirty gloves, recognition of early symptoms, handwashing, and cleaning of cuts. The second measured hygienic practices (11 items) on a four-point frequency scale (1 = Never, 2 = Sometimes, 3 = Often, 4 = Always), covering the use and care of protective gear, handwashing, avoiding prolonged wetness, post-shift hygiene, wound care, and skin-barrier restoration.

Mean scores were interpreted as follows: 1.00–1.74, Low/Poor; 1.75–2.49, Moderate; 2.50–3.24, High; and 3.25–4.00, Very High. The instrument was validated by a panel of experts composed of a community health nurse, a dermatologist, and a licensed professional teacher, who evaluated the relevance, clarity, and appropriateness of the items. Pilot testing was conducted among 10% of the sample (about 15 respondents) to assess clarity, feasibility, and reliability. Cronbach's alpha yielded coefficients of 0.888 for Section B and 0.866 for Section C, both indicating good reliability.

Data Gathering Procedure

The researchers aligned the instrument with the study objectives, and it was content-validated by the expert panel. Ethical clearance was granted by the University of the Assumption Research Ethics Board (UA REB) on February 12, 2026. A letter of intent was submitted to the Dean of the College of Nursing and Pharmacy, followed by a data-gathering request letter to the Acting City Administrator. After approval and pilot testing, the questionnaires were administered face-to-face to the respondents together with an informed consent form, and each took about 10–15 minutes to complete. The accomplished questionnaires were checked for completeness, encoded, and organized using Google Sheets.

Statistical Treatment of Data

Data were analyzed using IBM SPSS Statistics. Frequency and percentage distributions described the demographic and work profile. The prevalence of each skin condition was computed as the number of respondents reporting the condition divided by the total number of respondents (n = 152), multiplied by 100. Weighted mean and standard deviation summarized the level of perception on preventive measures and the hygienic practices. The Pearson Product-Moment Correlation (Pearson r) determined the

strength and direction of the relationships among the variables. All tests were conducted at the 0.05 level of significance.

Scope and Limitations

The study covered 152 meat and fish vendors aged 18–59 years in the Old and New San Fernando Public Markets during the academic year 2025–2026 and excluded vendors from other locations. It focused on the prevalence and common types of self-reported skin conditions and on the vendors' level of perception on preventive measures and hygienic practices, as measured by a questionnaire.

The study did not include clinical diagnosis or medical management of skin conditions, since all data were self-reported, and it did not involve biological or environmental testing. Because of its cross-sectional design, the study identified associations but did not establish causality. Purposive sampling and a single locale also limit generalizability, and self-reports may be affected by recall and social desirability bias. The findings were intended for academic purposes, health awareness, and the development of preventive strategies for the target population.

RESULTS

Table 1 presents the demographic and work profile of the 152 meat and fish vendors. The largest age group was 50–59 years old (30.3%), followed by 40–49 years old (27.0%), 30–39 years old (24.3%), and 18–29 years old (18.4%). Male respondents comprised 54.6% of the sample, while females comprised 45.4%. In terms of employment status, 52.0% were owners and 48.0% were workers. Regarding the type of product handled, 46.1% sold meat, 34.2% sold fish, and 19.7% sold both meat and fish. The highest proportion of respondents had 2–5 years of work experience (18.4%), followed by 6–10 years (17.8%) and 11–15 years (16.4%). Most respondents worked 8–10 hours per day (48.7%), followed by 6–8 hours (32.2%), more than 10 hours (13.8%), and less than 6 hours (5.3%).

Table 1: Demographic and Work Profile of Meat and Fish Vendors

Variable	Category	Frequency	Percent
Age	18-29 years old	28	18.4
	30-39 years old	37	24.3
	40-49 years old	41	27.0
	50-59 years old	46	30.3
Sex	Female	69	45.4
	Male	83	54.6

Employment Status	Owner	79	52.0
	Worker	73	48.0
Type of Product Handled	Meat	70	46.1
	Fish	52	34.2
	Both	30	19.7
Length of Work Experience	4 weeks to less than 6 months	4	2.6
	6 months-1 year	11	7.2
	2-5 years	28	18.4
	6-10 years	27	17.8
	11-15 years	25	16.4
	16-20 years	21	13.8
	21-30 years	17	11.2
	31-40 years	15	9.9
	41-50 years	3	2.0
	50-59 years	1	0.7
Average Working Hours Per Day	Less than 6 hours	8	5.3
	6-8 hours	49	32.2
	8-10 hours	74	48.7
	More than 10 hours	21	13.8

Table 2 presents the prevalence of self-reported skin conditions among the respondents during the last six months. Lichenification (skin thickening) had the highest prevalence, affecting 97 respondents (63.8%). Dryness and itching each affected 96 respondents (63.2%), tying for second. Burning or soreness was reported by 89 respondents (58.6%), followed by cracking (54.6%), blister formation (52.6%), redness (50.7%), and wounds or cuts that did not heal easily (47.4%).

Table 2: Prevalence of Self-Reported Skin Conditions Among Meat and Fish Vendors in the Last Six Months

Self-Reported Skin Condition	Number of Respondents	Prevalence (%)	Rank
Lichenification (skin thickening)	97	63.8	1
Dryness of the skin	96	63.2	2.5
Itching of the skin	96	63.2	2.5
Burning or soreness of the skin	89	58.6	4
Cracking of the skin	83	54.6	5
Blister formation	80	52.6	6
Redness of the skin	77	50.7	7
Wounds or cuts that do not heal easily	72	47.4	8
Note. Prevalence of each condition = (number of respondents reporting the condition in the last six months ÷ total respondents) × 100.			

Table 3 presents the respondents' level of perception on preventive measures. Of the 152 respondents, 63 (41.4%) had a high level of perception, 61 (40.1%) had a very high level, 26 (17.1%) had a moderate level, and 2 (1.3%) had a low level. The overall mean was 3.11 (SD = 0.68), interpreted as a High Level of Perception, with a modal rating of 3.

Table 3: Level of Perception on Preventive Measures of Meat and Fish Vendors

Mean Range	Verbal Description	Frequency	Percent
1.00-1.74	Low/Poor Level of Perception	2	1.3
1.75-2.49	Moderate Level of Perception	26	17.1
2.50-3.24	High Level of Perception	63	41.4
3.25-4.00	Very High Level of Perception	61	40.1

Total	152	100.0

Table 4 presents the respondents' level of hygienic practices. Among the respondents, 56 (36.8%) had a high level of practice, 50 (32.9%) had a very high level, 37 (24.3%) had a moderate level, and 9 (5.9%) had a low level. The overall mean was 2.84 (SD = 0.63), interpreted as a High Level of Practice, with a modal rating of 3.

Table 4: Level of Hygienic Practices of Meat and Fish Vendors

Mean Range	Verbal Description	Frequency	Percent
1.00-1.74	Low/Poor Level of Practice	9	5.9
1.75-2.49	Moderate Level of Practice	37	24.3
2.50-3.24	High Level of Practice	56	36.8
3.25-4.00	Very High Level of Practice	50	32.9
Total		152	100.0

Table 5 presents the relationships among the prevalence of skin conditions, the level of perception on preventive measures, and hygienic practices. The prevalence of skin conditions had a low positive correlation with perception on preventive measures ($r = .252$, $p = .002$) and with hygienic practices ($r = .345$, $p < .001$). Hygienic practices and perception on preventive measures had a moderate positive correlation ($r = .550$, $p < .001$). All relationships were significant at the 0.01 level (2-tailed). Since all p-values were below .05, the null hypothesis of no significant relationship was rejected.

Table 5: Relationship Between Perception on Preventive Measures, Hygienic Practices, and Prevalence of Skin Conditions

Variables	Pearson r	Interpretation	p-value	Interpretation
Prevalence of skin conditions and perception on preventive measures	.252**	Low positive	.002	Highly significant
Prevalence of skin conditions	.345**	Low positive	<.001	Highly significant

and hygienic practices				
Hygienic practices and perception on preventive measures	.550**	Moderate positive	<.001	Highly significant
Note. **Correlation is significant at the 0.01 level (2-tailed).				

DISCUSSION

The findings indicate that self-reported skin conditions were common among the meat and fish vendors in the Old and New San Fernando Public Markets, even though the vendors showed high levels of perception on preventive measures and of hygienic practices. This section discusses the respondents' profile, the prevalence of skin conditions, the level of perception and hygienic practices, and the relationships among these variables.

1. Demographic and Work Profile

As shown in Table 1, most of the respondents were middle-aged to older adults, with 87 of 152 aged 40–59 years. Males (54.6%) slightly outnumbered females (45.4%), owners (52.0%) and workers (48.0%) were almost evenly represented, and meat vendors (46.1%) outnumbered fish vendors (34.2%) and those selling both (19.7%). Experience varied widely, but 52.6% had worked between 2 and 15 years. Most also worked long hours, as 62.5% worked eight hours or more per day (48.7% for 8–10 hours and 13.8% for more than 10 hours). This profile suggests that many vendors have had years of repeated contact with water and raw animal products. This resembles the exposure conditions in studies of seafood and fish workers, where frequent contact with fish, ice, and watery conditions (Hadaye & Dey, 2024) and prolonged wet work and long working hours (Le et al., 2020) were linked to skin problems. Because the respondents' profile was not analyzed against skin conditions, these characteristics can only be considered possible contributors.

2. Prevalence of Self-Reported Skin Conditions Among Meat and Fish Vendors in the Last Six Months

Table 2 shows that every skin condition was reported by nearly half or more of the respondents, ranging from 47.4% to 63.8%. Lichenification (skin thickening) was the most common (63.8%), followed by dryness and itching (63.2% each) and burning or soreness (58.6%). These symptoms are typical of skin barrier damage from repeated wetting and friction, and skin thickening is often associated with persistent itching and rubbing, which may point to long-standing irritation. Since these were self-reported and not clinically

verified, they describe reported symptoms rather than diagnosed conditions. The results are consistent with previous studies. Schütte et al. (2023) identified wet work as a major risk factor for occupational contact dermatitis, with prolonged water exposure, frequent handwashing, and irritants damaging the skin barrier, and Jacobsen et al. (2022), in a systematic review of 48 studies, found strong evidence linking irritant contact dermatitis to wet work. Johnson and Etokidem (2019) likewise noted the elevated risk of skin allergies and dermatitis among butchers in Nigeria, particularly without protective equipment. In terms of magnitude, the prevalence of the individual symptoms in this study is similar to or higher than the 42.3% of dermatoses among Sri Lankan food handlers (Fernando & Thamilvannan, 2021), the 50.5% of hand dermatitis among seafood workers in China (Le et al., 2020), and the half of Mumbai fisherwomen with skin problems (Hadaye & Dey, 2024). However, a direct comparison is limited because these studies involved different populations and measures. This study adds local evidence from Philippine public markets, which the earlier studies did not cover.

3. Level of Perception and Hygienic Practices

Table 3 shows that the respondents had a high level of perception on preventive measures (M = 3.11, SD = 0.68), with 81.6% in the high to very high categories and only 1.3% in the low category. This suggests that most vendors understand the risks of wet work and the importance of handwashing and of cleaning cuts immediately. This agrees with Oliveira et al. (2024), who found that most food handlers in butcher and fishmonger establishments had sufficient hygiene knowledge, and with Henderson (2026), whose nationwide survey of U.S. food handlers showed a strong understanding of handwashing and personal cleanliness. Table 4 shows that hygienic practices were also high (M = 2.84, SD = 0.63), but lower than perception. Only 69.7% were in the high to very high categories, and 30.3% were in the moderate or low categories, compared with 18.4% for perception. This means vendors may know more than they consistently do. The same gap was found by Hasan et al. (2024), where 70.7% of meat handlers in Bangladesh had good knowledge and 53% a positive attitude, but only 49.8% had good practices. It also agrees with Kenaw et al. (2024) and Fayemi et al. (2026), who attributed weak practices to limited sanitation facilities, lack of training, and inconsistent use of protective equipment. Likewise, Oliveira et al. (2024) noted inadequate infrastructure despite good knowledge, and Basadre et al. (2025) found hygiene deficiencies among fish vendors in Panabo City, such as dirty aprons and limited access to clean water. In market settings, long working hours and limited facilities may make it harder to turn awareness into consistent practice.

4. Relationship Among the Variables

As shown in Table 5, perception on preventive measures and hygienic practices had a moderate positive correlation ($r = .550$, $p < .001$), meaning vendors who better understand preventive measures also tend to practice them more often. This is in line with Henderson (2026), who emphasized that knowledge and continuous reminders support proper worker practices. At the same time, practice scores remained lower than perception scores, which fits the knowledge-practice gap reported by Hasan et al. (2024).

The prevalence of skin conditions had low positive correlations with perception on preventive measures ($r = .252$, $p = .002$) and with hygienic practices ($r = .345$, $p < .001$). This means that vendors with higher perception and practice scores also reported more skin conditions. This is inconsistent with what Hadaye and Dey (2024) described, where fisherwomen were more likely to develop skin problems when they did not know how to care for their skin or did not wear protective gear. Because the study was cross-sectional, the direction of the relationship cannot be determined, and the following explanations are only possible and were not tested. First, vendors who already had skin problems may have become more aware and more careful, which suggests a reactive learning pattern. Second, ongoing exposure may outweigh the benefit of awareness. Jacobsen et al. (2022) noted that healing is poor unless exposure is reduced, and Schütte et al. (2023) identified prolonged wet work as a risk factor regardless of other conditions. Third, several of the practices measured, such as frequent handwashing, glove use, and cleaning of protective gear, are themselves forms of wet work or irritant exposure that the literature links to dermatitis. Jacobsen et al. (2022) found moderate evidence of irritant contact dermatitis when gloves were combined with other wet-work irritants, Schütte et al. (2023) linked frequent handwashing to skin barrier damage, and Hon et al. (2021) observed that meat processing workers had more wet work and used hand sanitizers and changed gloves more frequently. The study did not measure exposure intensity, glove type, or pre-existing skin conditions, so these explanations should be examined in future research. Overall, the results suggest that awareness and practice alone may not be enough to prevent skin conditions without a supportive working environment.

In response to the high frequency of skin conditions and the significant relationships between the vendors' perception and hygienic practices and their skin conditions, the study proposed the health promotion plan BALATalinong Vendor: Clean Stalls, Safe Hands and Protected Skin. By encouraging appropriate handwashing, regular use of protective equipment, early care of cuts and wounds, and the use of skin barrier protection, the plan aims to close the gap between awareness and actual practice. It also provides practical routines that can be added to the vendors' daily work to support skin protection, and it promotes a safer and more sustainable working environment for the meat and fish vendors of the Old and New San Fernando Public Markets.

Conclusions

This study determined the level of perception on preventive measures and hygienic practices of meat and fish vendors in the Old and New San Fernando Public Markets and assessed their relationship with the prevalence of skin conditions. Based on the findings, the following conclusions are drawn in line with the objectives of the study:

On demographic and work profile. The 152 respondents were mostly middle-aged to older adults, with the largest group aged 50–59 years (30.3%). Slightly more than half were male (54.6%) and owners (52.0%), and meat vendors were the largest group (46.1%). Most had worked as vendors for several years, and 62.5% worked eight or more hours per day. The vendors therefore have long and repeated exposure to wet conditions and raw animal products.

On prevalence and common types of skin conditions. Skin conditions were common among the vendors, with every condition reported by 47.4% to 63.8% of respondents. Lichenification (skin thickening) was the most prevalent (63.8%), followed by dryness and itching (63.2% each), burning or soreness (58.6%), cracking (54.6%), blister formation (52.6%), redness (50.7%), and wounds or cuts that did not heal easily (47.4%). Skin conditions are therefore a significant occupational health concern among meat and fish vendors.

On level of perception on preventive measures and hygienic practices. The vendors had a high level of perception on preventive measures (M = 3.11, SD = 0.68) and a high level of hygienic practices (M = 2.84, SD = 0.63). Hygienic practices scored lower than perception, which suggests that vendors' awareness is somewhat higher than how consistently they practice it.

On relationship among the variables. Significant positive relationships were found between the prevalence of skin conditions and perception on preventive measures ($r = .252$, $p = .002$), and between the prevalence of skin conditions and hygienic practices ($r = .345$, $p < .001$). Hygienic practices and perception on preventive measures also had a moderate positive relationship ($r = .550$, $p < .001$). Since all p-values were below the 0.05 level of significance, the null hypothesis was rejected. Skin conditions remained common even among vendors with high perception and practice scores, which suggests that awareness and hygienic practices alone may not be enough to prevent skin conditions without a working environment that supports health and safety. Because the study was cross-sectional and the conditions were self-reported, these relationships show association and do not establish cause and effect.

Overall, the study concludes that occupational skin conditions are a relevant health concern among meat and fish vendors in the Old and New San Fernando Public Markets. The findings support continuing health promotion, the appropriate use of protective equipment, and stronger occupational health support for vendors.

Recommendations

For the recommendations, the findings of this study highlighted the high prevalence of occupational skin conditions among meat and fish vendors despite their high level of perception regarding preventive measures and hygienic practices. Based on these findings, the researchers proposed the following recommendations:

Meat and Fish Vendors. Consistently practice proper handwashing, skin care, and PPE use, particularly when handling raw meat, fish, and water, and immediately clean and protect cuts or wounds; seek medical consultation when persistent skin irritation or other skin conditions occur.

Healthcare Professionals. Conduct continuous health education on proper hygiene, skin care, PPE use, and early recognition of occupational skin conditions, while providing appropriate guidance and advocating for safer workplace practices among market vendors.

Market Administrators and LGUs. Strengthen sanitation and occupational health programs by ensuring access to clean water, improving sanitation facilities, implementing proper waste management, conducting regular inspections, and organizing health assessments or dermatological consultations for vendors.

Educational Institutions. Use the findings as a basis for community health activities and outreach programs that promote occupational health, proper hygiene, skin protection, and disease prevention among meat and fish vendors.

Future Researchers. Conduct similar studies with larger and more diverse populations and consider clinical skin assessments, environmental exposure, daily work duration, PPE use, and existing health conditions to provide a more comprehensive understanding of occupational skin conditions.

In response to the high prevalence of skin conditions despite the vendors' high level of perception, the researchers proposed the health promotion plan **BALATalinong Vendor: Clean Stalls, Safe Hands and Protected Skin** for meat and fish vendors, both owners and workers in the public market. The plan aims to increase vendors' understanding of proper handwashing and personal protective equipment (PPE), develop a consistent handwashing routine during work hours, keep stalls and equipment clean, encourage regular PPE use, and promote immediate care of cuts or wounds to protect the skin and prevent occupational skin conditions. It also recognizes barriers such as the lack of continuous monitoring, forgetfulness or lack of habit formation, resistance to behavior change, limited time for cleaning, and inconsistent use of hygiene kits. To address these, the plan uses three strategies: visual reinforcement through easy-to-read posters in stalls showing proper handwashing, PPE use, and basic wound care; supportive resource distribution through a communal skin protection kit placed at the washing station, with use recorded in a logbook; and routine reminders to wash hands regularly, use PPE consistently, and check for cuts during work hours.

Compliance with Ethical Standards

The researchers declare that this study complied with ethical standards in its conduct and reporting. Ethical clearance was granted by the University of the Assumption Research Ethics Board (UA REB) on February 12, 2026, before data collection began. Informed consent, written in English and Filipino, was obtained from every respondent after the purpose, significance, and duration of the study were explained. Participation was entirely voluntary, no incentives or pressure were used, and respondents were told that they could skip any question or withdraw at any time, in which case their data would be excluded. Anonymity was maintained, as names and stall numbers were not collected, and responses were encoded anonymously. The data were stored securely, accessed only by the researchers, and handled in accordance with the Data Privacy Act of 2012. The respondents' well-being was safeguarded: the study involved only a survey questionnaire with no invasive or sensitive procedures, and the only anticipated inconvenience was the time taken from their work. The researchers declare that they have no financial interest in the study. One potential conflict of interest was identified and disclosed, since the research adviser also serves as Chairperson of the UA REB, and the

ethical procedures of the study were strictly followed. Plagiarism was strictly avoided, and the manuscript underwent plagiarism review. The researchers interpreted the findings objectively and reported them as the data showed, without bias. The results were used solely for academic and research purposes. Claude (Anthropic) was used to check and edit the manuscript's wording and structure against the journal's criteria. The researchers reviewed all content and take full responsibility for it.

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