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Compliance with Infection Prevention and Control (IPC) Program in Selected Public Hospitals in Calamianes Island: Basis for Improvement and Practice

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Abstract

This study assessed the knowledge and compliance of healthcare workers regarding Infection Prevention and Control (IPC) in selected public hospitals in the Calamianes Islands, specifically Culion Sanitarium and General Hospital and Coron District Hospital. The study was anchored on Florence Nightingale's Environmental Theory, Germ Theory, and the Theory of Planned Behavior, with support from the Theory of Reasoned Action. A quantitative descriptive research design was used, employing a structured survey questionnaire administered to 67 purposively selected healthcare workers who had at least one year of service in the selected hospitals. Data were analyzed using frequency, percentage, weighted mean, median, rank, and nonparametric descriptive techniques. Findings showed that IPC strategies were highly implemented in hand hygiene, personal protective equipment use, cleaning practices, and handling and disposal of sharps. Respondents demonstrated strong IPC knowledge, with 39 or 58.2% classified as Highly Knowledgeable and 28 or 41.8% as Knowledgeable. Compliance with IPC standards was also favorable, with 66 or 98.5% classified as Compliant and one or 1.5% as Moderately Compliant. Identified areas needing reinforcement included hand hygiene during emergencies, PPE-related discomfort, interpretation of reusable PPE and glove disinfection, detergent-disinfectant practices, and PPE use during sharps handling. The study concluded that healthcare workers had substantial IPC knowledge and compliance, but continuous reinforcement remains necessary. The CALAMIANES SAFECARE IPC PROGRAM was proposed to strengthen competency validation, monitoring, policy harmonization, training, documentation, occupational safety, and institutional sustainability. The study aligns with SDG 3, SDG 4, SDG 8, SDG 9, SDG 16, and SDG 17 by supporting safer healthcare, professional education, workforce protection, institutional improvement, governance, and collaboration. Its sustainability impact lies in strengthening public health, institutional systems, policy implementation, and healthcare worker safety in local public hospitals.

Keywords: Calamianes Islands, Healthcare Workers, Infection Prevention and Control, Patient Safety, Public Hospitals, Sustainability

1. Introduction

Infection Prevention and Control (IPC) is a core component of healthcare quality, patient safety, occupational protection, and institutional resilience. This study focuses on the level of knowledge and compliance regarding IPC among healthcare workers in selected public hospitals in the Calamianes Islands, particularly Culion Sanitarium and General Hospital and Coron District Hospital. It examines IPC practices related to hand hygiene, personal protective equipment, cleaning practices, and sharps handling and disposal, with the goal of generating evidence-based policy and program recommendations for improving IPC implementation in local public healthcare institutions.

Infection Prevention and Control remains essential in reducing preventable infections, protecting healthcare workers and patients, and improving the quality of healthcare delivery. The World Health Organization (2024) defined Infection Prevention and Control as a practical, evidence-based approach intended to prevent avoidable infections among patients and healthcare personnel during healthcare service delivery. IPC is therefore central to reducing healthcare-associated infections (HAIs), minimizing occupational exposure, strengthening patient safety, and sustaining institutional preparedness. In healthcare settings, infection may spread through airborne transmission, direct and indirect contact, contaminated surfaces, unsafe handling of bodily fluids, contaminated food or water, and improper disposal of medical waste and sharps. Alhumaid et al. (2021) emphasized that healthcare-associated infections remain a global concern because inadequate infection prevention practices increase risks for patients and healthcare workers. These risks require comprehensive IPC systems that integrate hand hygiene, personal protective equipment, environmental sanitation, aseptic techniques, waste management, and standard precautions. Patient safety is also closely tied to the effectiveness of IPC systems. Al-Omari et al. (2020) emphasized that healthcare quality improvement cannot be fully achieved without strong infection prevention systems because preventable infections affect patient outcomes, institutional performance, and

workforce safety. Thus, IPC is not merely a procedural requirement but a quality improvement strategy that supports safe care, professional accountability, and institutional development.

The literature consistently presents IPC as a multidimensional healthcare priority involving environmental safety, biological risk control, institutional policy, healthcare worker knowledge, and behavioral compliance. The World Health Organization (WHO, 2022) defined IPC as an evidence-based and practical approach for preventing avoidable infections acquired during healthcare delivery. This definition positions IPC as both a clinical safety standard and a systems-level intervention for protecting patients, workers, visitors, and communities. The Centers for Disease Control and Prevention (CDC, 2023) emphasized standard precautions as the universal foundation of IPC across healthcare settings. These include hand hygiene, PPE use, respiratory hygiene, environmental cleaning and disinfection, safe injection practices, aseptic procedures, sterilization, and safe sharps handling. These principles directly align with the study's focus on hand hygiene, PPE, cleaning practices, and sharps disposal. Studies also show that IPC effectiveness depends heavily on healthcare worker competence, training, and adherence. Thakur and Rao (2024) underscored that effective IPC practice depends on healthcare workers' knowledge, attitudes, and consistent adherence to prevention measures. Catacutan et al. (2025) found that insufficient training and limited continuing education contributed to IPC knowledge gaps among healthcare workers, highlighting the need for regular and structured IPC training. Recent studies further demonstrate the importance of IPC during health emergencies and institutional outbreaks. Tomczyk et al. (2021) emphasized that the COVID-19 pandemic heightened the urgency of robust IPC implementation, especially in healthcare facilities vulnerable to infectious disease outbreaks. Tartari et al. (2020) found that strengthened IPC systems are essential in combating healthcare-associated infections and antimicrobial resistance while improving outbreak preparedness. Behavioral and organizational factors also influence IPC outcomes. Houben et al. (2024) concluded that multifaceted strategies, tailored communication, organizational integration, and continuing education are necessary to strengthen IPC culture. Houben et al. (2021) identified professional attitudes, organizational support, guideline clarity, workload, and institutional resources as important barriers and facilitators of IPC implementation. Non-compliance has serious consequences for healthcare systems. Campo et al. (2024) found that healthcare-acquired infections increase morbidity, mortality, healthcare costs, and reduce patient quality of life when healthcare staff fail to adhere to IPC standards. Rhee et al. (2020) showed that aggressive IPC responses, including universal masking and strengthened protective protocols, improved institutional infection prevention during the COVID-19 pandemic. Qureshi et al. (2022) similarly emphasized the importance of multimodal occupational IPC training and institutional learning cultures in reducing infection risks among healthcare workers. In the Philippine context, De Claro et al. (2023) found that IPC measures in public hospitals and temporary treatment facilities were highly effective when systematically implemented and adequately supported. Kanu et al. (2021) and Deressa et al. (2021) identified healthcare workers as a high-risk population for infectious diseases and emphasized the importance of resources, preparedness, and preventive systems. Nduwimana et al. (2024) further highlighted that nurses with deeper knowledge and stronger professional experience were more effective in infection management, supporting the relevance of examining socio-demographic and professional factors in IPC outcomes.

Globally, IPC has become a major public health and healthcare quality concern because healthcare-associated infections, antimicrobial resistance, and infectious disease outbreaks continue to threaten patient safety and workforce protection. IPC strategies such as hand hygiene, PPE use, sanitation, sterilization, respiratory hygiene, and sharps safety are widely recognized as essential to reducing infection transmission in healthcare institutions. Nationally, the relevance of IPC is evident in Philippine public healthcare institutions, where compliance with infection prevention standards supports safer care delivery, workforce safety, and institutional readiness. De Claro et al. (2023) showed that IPC measures in Philippine public hospitals and temporary treatment facilities can be effective when systematically implemented and supported, reinforcing the need for local institutional assessment. Locally, Culion Sanitarium and General Hospital and Coron District Hospital serve important healthcare roles in the Calamianes Islands. These hospitals implement IPC practices such as hand hygiene, single-use medical supplies, environmental cleaning and disinfection, aseptic technique, waste segregation, sharps disposal, sterilization protocols, linen sanitation, and infection control guidelines. However, despite these routine practices, limited empirical evidence exists regarding healthcare workers' actual IPC knowledge and compliance in these institutions. This makes a localized assessment necessary for identifying strengths, gaps, and opportunities for improvement.

The study is grounded in three complementary theories: Florence Nightingale's Environmental Theory, Germ Theory, and the Theory of Planned Behavior. Florence Nightingale's Environmental Theory explains the importance of cleanliness, sanitation, ventilation, safe water, light, and hygienic surroundings in disease prevention and recovery (Nightingale, 1860/1969). Cristine (2023) emphasized that Nightingale's framework remains relevant in modern nursing because environmental management continues to support infection prevention and patient recovery. Germ Theory provides the biological foundation for IPC by explaining that specific microorganisms cause many infectious diseases and can be transmitted through contaminated surfaces, unsafe clinical practices, poor hygiene, and inadequate barriers (Pasteur, 1861; Brock, 1999). This theory supports the need for handwashing, PPE use, cleaning and disinfection, sterilization, and sharps safety. The Theory of Planned Behavior explains how healthcare workers' IPC behavior may be shaped by attitudes, subjective norms, and perceived behavioral control (Ajzen, 1991). This is relevant because healthcare workers may know

IPC protocols but still vary in compliance depending on institutional expectations, workplace culture, resource availability, and perceived enforcement. The conceptual framework also draws from the Theory of Reasoned Action by Fishbein and Ajzen (1975), which links knowledge, beliefs, attitudes, behavioral intentions, and actual practices. At the systems level, Mangubat (2023) discussed how pandemic preparedness frameworks and health treaties strengthen healthcare systems through early warning systems, workforce capacity building, infection preparedness, and institutional resilience. This supports the policy-oriented direction of the study, which aims to generate program recommendations for strengthening IPC practice in selected public hospitals.

Although IPC practices are implemented in Culion Sanitarium and General Hospital and Coron District Hospital, there is limited localized evidence assessing healthcare workers' level of knowledge and compliance regarding IPC in the Calamianes Islands. Existing institutional practices alone do not confirm whether IPC protocols are consistently understood, applied, or followed by healthcare workers. The reviewed literature shows that IPC effectiveness depends on training, resources, organizational support, professional attitudes, guideline clarity, and compliance culture. However, there remains a need for context-specific assessment in geographically significant public hospitals in Palawan. This study addresses that gap by examining healthcare workers' IPC knowledge and compliance and by identifying areas that may require policy reinforcement, workforce training, monitoring, and institutional improvement. The rationale for the study is therefore practical, institutional, and evidence-based. Its findings are intended to support safer patient care, stronger healthcare worker protection, improved compliance culture, and policy or program recommendations that can enhance IPC systems in the selected hospitals.

This study naturally aligns with SDG 3 – Good Health and Well-Being because it focuses on reducing healthcare-associated infection risks, improving patient safety, protecting healthcare workers, and strengthening public health systems. IPC contributes directly to safer healthcare delivery and infection risk reduction. It also aligns with SDG 4 – Quality Education through its emphasis on IPC knowledge, continuing education, competency reinforcement, and healthcare worker training. The findings can support structured seminars, in-service training, and professional development programs for healthcare personnel. The study is relevant to SDG 8 – Decent Work and Economic Growth because IPC protects healthcare workers from occupational exposure and infection-related hazards, contributing to safer and more sustainable working conditions in healthcare institutions. It supports SDG 9 – Industry, Innovation and Infrastructure by promoting stronger institutional systems, monitoring mechanisms, policy improvement, and healthcare quality infrastructure. Strengthened IPC systems contribute to more resilient and reliable public hospitals. The study also connects with SDG 16 – Peace, Justice, and Strong Institutions because it supports evidence-based institutional governance, policy standardization, accountability, and compliance with healthcare safety standards. Finally, it relates to SDG 17 – Partnerships for the Goals because IPC improvement requires collaboration among hospital administrators, nursing service offices, healthcare workers, academic institutions, policymakers, and public health stakeholders.

The study contributes to public health sustainability by supporting infection prevention practices that reduce transmission risks and improve hospital safety. Strong IPC systems help protect patients, healthcare workers, and communities from preventable infections. It contributes to institutional sustainability by providing evidence that hospitals can use to improve policies, strengthen compliance monitoring, support accreditation goals, and enhance quality assurance systems. For Culion Sanitarium and General Hospital and Coron District Hospital, the findings can guide institutional planning and targeted improvement. The study supports educational sustainability by identifying IPC knowledge needs that can inform continuing professional education, seminars, workshops, and competency-building programs. This strengthens healthcare workers' capacity to sustain evidence-based practice. It also advances occupational and workforce sustainability by emphasizing healthcare worker protection, safe clinical practice, PPE use, sharps safety, and reporting of occupational exposure. Safer working conditions support workforce resilience and professional accountability. Finally, the study contributes to policy and governance sustainability by generating localized evidence for policy refinement, program development, compliance reinforcement, and leadership decision-making. Through these contributions, the research supports a multidisciplinary approach to sustainable healthcare improvement in the Calamianes Islands.

2. Material and methods

2.1 Research Design

The study employed a quantitative descriptive research design to assess the level of knowledge and compliance regarding IPC among healthcare workers in selected public hospitals in the Calamianes Islands. This design was appropriate because it allowed the researcher to gather measurable numerical data, describe existing conditions, and identify patterns in healthcare workers' IPC-related knowledge and compliance without manipulating variables. Descriptive research is suitable for providing an accurate portrayal of current conditions, behaviors, or practices as they naturally occur (Gray et al., 2017). A survey-based descriptive approach was used through structured questionnaires administered to qualified respondents. Survey research is an effective quantitative strategy for collecting standardized data from a target population, particularly when assessing attitudes, perceptions, practices, and factual knowledge across several variables (Groves et al.,

2009). Through this design, the study quantified responses related to hand hygiene, PPE use, cleaning practices, sharps management, IPC knowledge, and adherence to IPC protocols.

2.2 Locale of the Study

The study was conducted in selected public hospitals in the Calamianes Islands, specifically Culion Sanitarium and General Hospital and Coron District Hospital. These institutions were chosen because they serve as major public healthcare facilities in the area and provide relevant settings for examining hospital-based IPC knowledge and compliance among healthcare workers.

2.3 Respondents of the Study

The respondents were healthcare workers currently employed at Culion Sanitarium and General Hospital and Coron District Hospital. They were selected because the objectives, instrument, and statement of the problem focused specifically on healthcare workers' level of knowledge and compliance with IPC standards and protocols. Patient participants were not included to maintain consistency among the research objectives, instrument, and statistical framework.

2.4 Sample and Sampling Procedure

The study used purposive sampling to select respondents. Purposive sampling, also known as judgmental sampling, is a non-probability sampling method in which participants are intentionally chosen based on criteria relevant to the study objectives (Etikan et al., 2016). This method was appropriate because the study required participants with direct professional experience, institutional exposure, and practical involvement in hospital-based IPC practices. The final sample consisted of 67 healthcare workers from the selected hospitals. Respondents were included if they were currently employed in either Culion Sanitarium and General Hospital or Coron District Hospital, had regular, permanent, or active healthcare-related employment status, had rendered at least one year of service, and were willing to participate voluntarily. Healthcare workers with less than one year of service, temporary personnel without sufficient institutional exposure, non-healthcare-related staff, and individuals unwilling to provide informed consent were excluded.

2.5 Research Instrument

A structured survey questionnaire was used to gather quantitative data on healthcare workers' IPC knowledge and compliance. The knowledge section assessed core IPC concepts such as infection transmission, hand hygiene, PPE use, environmental cleaning, sharps disposal, and transmission-based precautions. The compliance section assessed adherence to IPC standards in practical situations, including exposure management, PPE use, handwashing, sharps handling, isolation precautions, and occupational reporting. Responses were scored dichotomously, with "yes" or compliant answers assigned one point and "no" or non-compliant answers assigned zero, then interpreted from Not Knowledgeable to Highly Knowledgeable and from Non-Compliant to Highly Compliant.

2.6 Data Gathering Procedure

Before data collection, the researcher secured approval from Palawan State University and permission from Culion Sanitarium and General Hospital and Coron District Hospital. Eligible respondents were identified with hospital authorities, informed about the study, and asked to provide voluntary informed consent. Confidentiality, anonymity, and the right to withdraw were assured in accordance with the Data Privacy Act of 2012 and institutional ethical standards. The researcher personally administered the questionnaires, retrieved the completed forms, checked them for completeness, and prepared the data for coding, tabulation, and statistical analysis.

2.7 Data Analysis Techniques

Completed questionnaires were checked, coded, and entered into a spreadsheet for statistical analysis. Data screening was conducted to ensure reliability and reduce interpretation bias (Polit & Beck, 2021). Since the study involved 67 respondents and used ordinal and dichotomous data, nonparametric statistical tools were applied, as these are appropriate for small samples and categorical or ordinal variables (Field, 2018; Pallant, 2020). Frequency, percentage, median, interquartile range, and rank were used to analyze IPC knowledge and compliance. Scores were interpreted using predetermined categories, and policy and program recommendations were based on areas with lower scores or compliance levels.

2.8 Ethical Considerations

The study observed ethical standards to protect the rights, safety, dignity, and privacy of the respondents. Formal approval was secured from the appropriate academic and institutional authorities before data collection. Participation was voluntary, and informed consent was obtained after explaining the study's purpose, procedures, risks, benefits, confidentiality safeguards, and participant rights. Respondents could refuse or withdraw at any time without penalty. Confidentiality and anonymity were maintained through coded data, and only aggregated results were reported. All data were handled honestly and objectively in accordance with beneficence, non-maleficence, justice, and Republic Act No. 10173, or the Data Privacy Act of 2012.

3. Results and Discussion

3.1 Compliance with Infection Prevention and Control Strategies

3.1.1 Hand Hygiene

The respondents demonstrated a highly implemented level of hand hygiene practices, with an overall weighted mean of 3.80. The highest-rated indicators were receiving regular feedback on hand hygiene practice and considering hand hygiene as the most important part of work, both with weighted means of 3.99. Performing hand hygiene before patient contact was also highly implemented, with a weighted mean of 3.96. Other highly implemented indicators included being taught the 5 Moments Method, availability of soaps or hand towels, awareness of hand hygiene for patient safety, and recognition that hand hygiene prevents infection. The lowest-rated indicator was difficulty performing hand hygiene during emergencies, with a weighted mean of 2.85, interpreted as implemented rather than highly implemented. These findings affirm the central role of hand hygiene in IPC practice. Chakma et al. (2024) emphasized hand hygiene as the most essential measure for reducing healthcare-associated infections, especially when supported by education, infrastructure, and behavioral reinforcement. The high ratings for feedback, training, and accessibility suggest institutional support for hand hygiene, consistent with evidence that sustained compliance improves when healthcare workers receive regular support, monitoring, and environmental facilitation (Armstrong-Novak et al., 2023; Chakma et al., 2024). The findings also suggest that hand hygiene has become part of the respondents' safety culture, consistent with Kim & Sim, 2025 and Alodhialah et al. (2025). However, the lower score during emergencies reflects the influence of clinical urgency on standard precautions, as Hu et al. (2025 acknowledged that adherence may fluctuate in time-sensitive or high-acuity situations.

3.1.2 Personal Protective Equipment

The respondents also reported highly implemented PPE-related IPC strategies, with an overall weighted mean of 3.38. The highest-rated indicators were that PPE increases safety at work and that respondents did not experience injury while not wearing PPE, both with weighted means of 3.93. Training on PPE use was also highly implemented, with a weighted mean of 3.91, followed by adequate PPE provision at 3.87 and awareness of hospital PPE standards at 3.85. Indicators on PPE discomfort, such as exhaustion and difficulty lifting arms and legs while wearing PPE, both received weighted means of 2.51 and were interpreted as implemented. The lowest-rated items were reusable PPE being considered safe, with a weighted mean of 1.90, and disinfecting gloves after each use, with a weighted mean of 2.16, both interpreted as less implemented. The high PPE scores indicate that PPE protocols were generally institutionalized among respondents. According to the World Health Organization (2020), proper PPE use is a critical component of standard precautions and occupational safety. The findings suggest that PPE training, provision, and policy reinforcement were embedded in the respondents' work environment. The strong safety perception toward PPE also aligns with evidence that PPE adherence improves when healthcare workers internalize protective practices as professional responsibilities (George et al., 2023; Ismarina et al., 2026). The Health Belief Model similarly explains that preventive behavior increases when workers perceive both susceptibility to harm and the benefits of intervention (Alyafei & Easton-Carr, 2024). Meanwhile, the lower scores on reusable PPE, glove disinfection, and physical burden reflect technical and ergonomic complexities in PPE use. These findings are consistent with studies noting that prolonged PPE use may cause discomfort, fatigue, reduced mobility, and occupational strain (George et al., 2023; Kumar et al., 2023).

3.1.3 Cleaning Practices

Cleaning practices were highly implemented overall, with a weighted mean of 3.52. The highest-rated indicator was the cleaning of surfaces touched by patients and healthcare providers, with a weighted mean of 3.85. This was followed by proper training of cleaning staff at 3.84 and the use of gloves and aprons when handling soiled linen or clothing at 3.79. Respondents also highly implemented practices related to quality cleaning, blood spill management, and color-coded cleaning equipment. The lowest-rated indicators were combining detergents with disinfectant, with a weighted mean of 2.49, and cleaning rooms or wards on a weekly basis to prevent infection, with a weighted mean of 2.31, both interpreted as less implemented. The findings reinforce the importance of environmental sanitation as a foundation of IPC. Environmental cleaning is essential in minimizing pathogen transmission through contaminated surfaces, equipment, and healthcare environments (Apisarnthanarak & Weber, 2018). The high ratings for surface cleaning, staff training, and protective handling of soiled materials are consistent with Han et al. (2015), who emphasized high-touch surface cleaning, blood spill management, and proper linen handling as key defenses against healthcare-associated infections. The results also support the view that cleaning protocol effectiveness depends on competent and consistent implementation by trained personnel, as noted by the Commission for Hospital Hygiene and Infection Prevention (2024). The lower scores on detergent-disinfectant use and weekly cleaning may reflect differences in technical interpretation, role-specific knowledge, or awareness that active clinical areas require more frequent cleaning than weekly schedules. This aligns with literature noting that misunderstanding of cleaning chemistry and protocol standardization may occur when frontline staff are not directly involved in environmental sanitation planning (Parry et aal., 2022).

3.1.4 Handling and Disposal of Sharps

The handling and disposal of sharps were highly implemented, with an overall weighted mean of 3.60. The highest-rated indicator was knowing what action to take when a sharps injury occurs, with a weighted mean of 3.90. Other highly implemented practices included not resheathing used needles, disposing of syringes and needles as intact units whenever possible, recognizing that hand-passing exposed sharps may cause injury, using sharps containers, and reporting sharps-related injuries to the IPC unit. Risk assessment for sharps use and avoiding bending or breaking needles were also highly implemented. The only less implemented indicator was wearing PPE when using sharps, which obtained a weighted mean of 2.13. These results align with global IPC standards that identify safe sharps management as essential in reducing occupational exposure to bloodborne pathogens such as hepatitis B, hepatitis C, and HIV (WHO, 2003; Mohammed Hamed et al., 2025). The strong scores for non-resheathing, disposal, and injury reporting suggest that sharps safety protocols were well communicated and institutionalized. Prompt reporting and response are also central to post-exposure prophylaxis and worker safety systems (Eticha & Gemedaa, 2019; Han & Henderson, 2024). The findings may also be explained through the Health Belief Model and Safety Climate Theory, which suggest that safety behaviors improve when perceived risk is high and organizational norms reinforce protective action (Karl et al., 2022; Huang et al., 2023; Alyafei & Easton-Carr, 2026). However, the lower score for PPE use during sharps procedures suggests a gap between general sharps safety knowledge and PPE-specific behavior. De Carli et al. (2014) and George et al. (2023) argued that PPE compliance may be affected by availability, time pressure, inconvenience, and risk normalization.

3.2 Knowledge Regarding Infection Prevention and Control

3.2.1 Level of IPC Knowledge

The respondents showed strong IPC knowledge. Of the 67 healthcare workers, 39 or 58.2% were classified as highly knowledgeable, while 28 or 41.8% were classified as knowledgeable. No respondent was categorized as moderately knowledgeable, less knowledgeable, or not knowledgeable. Full recognition was recorded for several core IPC areas, including the primary goals of IPC, components of the chain of infection, transmission-based precautions, sharps container use, correct PPE removal sequence, and infections preventable through handwashing. Lower recognition appeared in selected items, such as mindful use of N95 masks at all times at 25.4%, removing visible dirt and debris as a purpose of environmental cleaning at 23.9%, and reducing contamination risk to clients and visitors before leaving isolation areas at 46.3%. The strong knowledge profile may reflect the combined effects of formal healthcare education, institutional orientation, and routine exposure to IPC policies. Healthcare worker education is a critical determinant of infection prevention capacity and occupational safety (Alhumaid et al., 2021). The high recognition of infection chains, sharps disposal, PPE procedures, and hand hygiene suggests that workplace reinforcement contributed to knowledge retention, consistent with findings that repeated exposure to IPC campaigns, PPE competency programs, and seminars improves healthcare workers' knowledge (Alhumaid et al., 2021; Chakma et al., 2024). However, universal endorsement of broad statements such as eliminating infections completely or creating sterile environments may indicate idealized rather than technically precise understanding. Prior studies note that healthcare workers may show strong practical awareness while occasionally oversimplifying technical IPC objectives (Alhumaid et al., 2021; Mulay et al., 2024). Overall, the results show that knowledge is a major strength among respondents and serves as a foundation for IPC practice under the Knowledge-Attitude-Practice model (Andrade et al., 2020; Zarei et al., 2024).

3.3 Compliance with Infection Prevention and Control Standards and Protocols

3.3.1 Compliance Profile and Protocol Recognition

The respondents' compliance with IPC standards and protocols was concentrated almost entirely in the compliant category. Sixty-six healthcare workers or 98.5% were classified as compliant, while one respondent or 1.5% was moderately compliant. No respondent was classified as highly compliant, less compliant, or non-compliant. The respondents showed strong recognition of correct IPC practices in blood exposure hygiene, PPE use for respiratory virus cases, soap-and-water use when hands are visibly soiled, terminal cleaning protection, immediate occupational exposure reporting, safe syringe handling in public areas, isolation precaution categories, nosocomial infection risk factors, and Infection Control Committee composition. The high compliance profile suggests that IPC standards were embedded in the respondents' routine clinical practice. Compliance is essential because healthcare-associated infection prevention depends not only on awareness but also on consistent behavioral execution (Alhumaid et al., 2021; Batran et al., 2025). The findings may reflect hospital orientation, policy enforcement, workplace supervision, and procedural training. Safety Climate Theory also suggests that adherence improves when institutions visibly commit to safety, leadership reinforcement, and accountability systems (Oah et al., 2018; Saleem & Malik, 2022). However, lower recognition of selected systems-level items, such as laboratory roles and antibiotic-related nosocomial factors, suggests that compliance may be stronger in routine operational tasks than in broader governance or antimicrobial stewardship domains. Alhumaid et al. (2021) similarly found that healthcare workers often show stronger compliance in directly actionable IPC behaviors than in broader systems-level competencies. The overall pattern is consistent with the Knowledge-Attitude-Practice model (Andrade et al., 2020; Zarei et al., 2024) and Theory of Planned Behavior (Ajzen, 1991), indicating that knowledge and institutional expectations had generally translated into compliant behavior.

3.4 IPC Enhancement Program

3.4.1 CALAMIANES SAFECARE IPC Program

The proposed CALAMIANES SAFECARE IPC PROGRAM was developed based on the study's findings, which showed high implementation, knowledge, and compliance, while also revealing areas needing reinforcement. The program focuses on IPC competency reinforcement, compliance monitoring, sharps and PPE safety, environmental cleaning and disinfection, hospital-based IPC policy harmonization, and continuous knowledge and awareness campaigns. It responds to identified gaps such as hand hygiene difficulty during emergencies, PPE-related physical burden, interpretation of reusable PPE, detergent-disinfectant practices, and PPE use during sharps handling. The program aims to strengthen procedural consistency, compliance monitoring, occupational safety, environmental hygiene, policy alignment, and sustained IPC awareness. The proposed program reflects the need to maintain high IPC performance through continuous institutional support rather than one-time corrective action. Its emphasis on training, monitoring, feedback systems, and policy alignment is consistent with the World Health Organization's "Core Components of Infection Prevention and Control Programmes," which highlights continuous education, monitoring, multimodal strategies, and institutional leadership (Storr et al., 2017). Similar strategies have been used in countries such as Singapore, South Korea, and the United Kingdom, where IPC frameworks combine audits, competency training, and environmental sanitation reinforcement (Tartari et al., 2020). In the Philippine context, public hospitals intensified PPE training, sanitation protocols, and healthcare worker safety monitoring during and after the COVID-19 pandemic (de Claro et al., 2023; Levya et al., 2024). Escalante and Alcala (2026) further emphasized administrative support, continuous IPC orientation, and institutional safety culture in sustaining compliance. The proposed program therefore provides a localized, systems-based framework for sustaining IPC resilience in public hospitals in the Calamianes Islands.

4. Conclusion & Recommendations

Healthcare workers in selected public hospitals in the Calamianes Islands demonstrated strong knowledge and favorable compliance regarding Infection Prevention and Control (IPC). Among the 67 respondents, 39 or 58.2% were classified as Highly Knowledgeable, while 28 or 41.8% were Knowledgeable; none were moderately knowledgeable, less knowledgeable, or not knowledgeable. Compliance was also high, with 66 respondents or 98.5% classified as Compliant and only one respondent or 1.5% classified as Moderately Compliant. These findings indicate substantial understanding and practice of IPC principles, including hand hygiene, transmission-based precautions, sharps management, environmental sanitation, PPE use, occupational exposure reporting, and isolation precautions. The proposed CALAMIANES SAFECARE IPC PROGRAM was considered necessary to sustain and strengthen IPC knowledge and compliance, particularly in emergency hand hygiene, PPE-related challenges, cleaning protocol interpretation, PPE use during sharps handling, policy harmonization, compliance monitoring, occupational safety, and institutional sustainability.

The study recommends strengthening IPC systems in Coron District Hospital and Culion Sanitarium and General Hospital through regular competency validation, refresher orientations, quarterly IPC audits, ward-based monitoring, policy standardization, documentation improvement, and alignment with Department of Health and World Health Organization standards. The Nursing Service Office should provide targeted in-service training on PPE use during sharps handling, environmental cleaning interpretation, and emergency-based infection prevention practices, while healthcare workers should sustain their IPC knowledge and compliance through active participation in training, monitoring, and professional development. Patients and healthcare consumers should be engaged through basic infection prevention education, while hospital administrators, policymakers, the Department of Health, and local government units should strengthen IPC governance, workforce safety policies, resource allocation, and monitoring systems. Academic institutions should integrate contextualized IPC learning and strengthen hospital partnerships, future researchers should expand the study to broader populations and methods, and the community and public health sector should continue coordinated infection prevention awareness, surveillance, preparedness, and inter-agency collaboration.

The study was limited to healthcare workers from selected public hospitals in the Calamianes Islands, specifically Culion Sanitarium and General Hospital and Coron District Hospital. Its findings were based on 67 purposively selected respondents and focused only on IPC knowledge and compliance within the identified institutional settings; therefore, the results are context-specific and may not be generalized to all healthcare institutions in Palawan or the Philippines.

Compliance with ethical standards

This study complied with institutional ethical standards and was conducted only after securing the necessary academic, ethical, and hospital approvals from Palawan State University and the selected public hospitals in the Calamianes Islands. Participation was voluntary, and all healthcare worker-respondents were informed of the purpose, procedures, benefits, and confidentiality safeguards of the study before giving informed consent. Respondents were assured of anonymity, the right to withdraw at any time, and the confidential handling of all data in accordance with the Data Privacy Act of 2012. The researcher declares no conflict of interest in the conduct of the study and assumes full responsibility for the accuracy,

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