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Equipment Reliability, Device Handling, and Continuity of Respiratory Care in Hospitals

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ABSTRACT

This study investigated how equipment reliability and device handling shaped the continuity of respiratory care in a hospital setting, with specific focus on Cagayan Valley Medical Center. A nonexperimental cross-sectional explanatory systems design was used to assess the interaction of equipment readiness, handling practices, and sustained respiratory care delivery. Participants were hospital personnel directly involved in respiratory care services, and data were gathered using a validated researcher-made questionnaire. The instrument showed excellent reliability, with an overall Cronbach's alpha of 0.96. Descriptive statistics and Partial Least Squares Structural Equation Modeling were used to analyze the data. Results showed that equipment reliability was moderately reliable, device handling was moderately evident, and continuity of respiratory care was moderately continuous. The findings indicated that respiratory equipment was generally functional and available, but gaps remained in timely repair, preventive maintenance, calibration checking, backup availability, alarm response, documentation, and shift-to-shift handover. Structural model results revealed that both equipment reliability and device handling had significant positive effects on continuity of respiratory care, with device handling emerging as the stronger predictor. The model explained a moderate proportion of variance in continuity of care, showing that sustained respiratory services depended on both dependable equipment and consistent clinical handling practices. The study concludes that improving respiratory care continuity requires an integrated hospital strategy that strengthens equipment maintenance, staff competency, documentation discipline, alarm management, and interprofessional coordination.

Keywords: *continuity of care, device handling, equipment reliability, hospital respiratory care, respiratory equipment*

INTRODUCTION

Respiratory care in hospitals depends not only on clinical knowledge but also on the readiness, proper handling, and continued availability of equipment used to support breathing, oxygenation, airway management, and patient monitoring. In acute and critical care areas, respiratory therapists and other healthcare professionals work with oxygen delivery systems, mechanical ventilators, humidification devices, suction machines, nebulizers, pulse oximeters, and related monitoring tools. These devices are central to the treatment of hypoxemia, respiratory failure, pneumonia, chronic pulmonary disease exacerbations, postoperative respiratory compromise, and other conditions requiring timely respiratory intervention. The World Health Organization and UNICEF recognized oxygen as a life-saving medical gas used across levels of the health system, while recent clinical practice guidance emphasized that oxygen therapy in acute care requires appropriate delivery methods, monitoring, and clinical judgment to prevent both under-treatment and unnecessary exposure to excessive oxygen (World Health Organization & UNICEF, 2019; Piraino et al., 2022).

Equipment reliability is therefore a patient safety concern in respiratory care. A device that is unavailable, poorly maintained, inconsistently calibrated, or prone to malfunction may delay treatment, interrupt oxygen delivery, compromise monitoring, or increase the possibility of clinical error. Zamzam et al. (2021) explained that medical equipment reliability is shaped by several attributes, including function, maintenance requirements, performance, safety, availability, readiness, utilization, and cost. These attributes show that reliability is not limited to whether a device can be turned on. It also involves whether the equipment performs according to expected standards, remains safe for patient use, is accessible when needed, and is supported by maintenance systems that allow healthcare workers to deliver timely care. In respiratory therapy, this issue becomes more important because respiratory deterioration can progress rapidly, and even short interruptions in oxygenation or ventilation may place patients at risk.

Device handling is equally important because many respiratory care devices require correct setup, adjustment, monitoring, cleaning, documentation, and handover. Errors may occur not only because equipment fails, but also because users may select an inappropriate device, apply incorrect settings, overlook alarms, miss signs of patient-device mismatch, or fail to communicate changes in therapy. A recent systematic review on medical device errors in intensive care units reported that ventilators and monitoring equipment were among the devices commonly involved in reported errors, and that these errors were linked to human factors, device design issues, and system failures (Ziaudeen et al., 2026). This finding is highly relevant to respiratory care because ventilators, oxygen devices, and monitoring systems are often used in high-pressure settings where staff must make rapid decisions while also ensuring that device operation remains accurate and safe.

Continuity of respiratory care refers to the sustained, coordinated, and documented delivery of respiratory interventions from assessment to treatment, monitoring, reassessment, referral, and follow-through. It is not enough for a device to function at the start of care if there is no consistent system for monitoring patient response, checking equipment status, documenting therapy changes, and communicating patient needs across shifts or units. Dummer and Stokes (2020) described continuity of care as coherent, logical, and timely care, especially during transitions, where gaps in communication and follow-up may threaten patient outcomes. In the hospital setting, continuity may be affected by equipment availability, staff familiarity with devices, maintenance response time, clarity of protocols, and the quality of coordination among respiratory therapists, nurses, physicians, biomedical personnel, and other members of the healthcare team.

The broader patient safety agenda also supports the need to examine equipment-related and process-related risks in respiratory care. The World Health Organization (2021) emphasized the reduction of avoidable harm through safer clinical processes, stronger health worker education, reliable systems, and better use of information for risk management. These priorities fit closely with respiratory therapy practice because safe respiratory care depends on both technical competence and dependable systems. When equipment reliability, device handling, and continuity of care are treated separately, important gaps may be missed. A ventilator may be reliable, but unsafe handling may still lead to harm. A therapist may be competent, but lack of available equipment may delay care. A device may be properly used in one shift, but poor handover may weaken continuity in the next. These realities point to the need for a study that looks at the three areas together rather than as isolated concerns.

The Cagayan Valley Medical Center serves a major healthcare role in the region and has been covered by legislation increasing its bed capacity from 500 to 1,000 beds, with corresponding upgrading of services, facilities, and workforce based on its hospital development plan (Republic Act No. 11498, 2020). As hospital capacity and service demand expand, the need for dependable respiratory care systems becomes more pressing. The study will contribute by examining how the reliability of respiratory care equipment and the handling practices of healthcare personnel relate to the continuity of respiratory care in the hospital. Its findings may provide practical evidence for strengthening equipment management, reinforcing safe device use, improving shift-to-shift and unit-to-unit coordination, and supporting safer respiratory care delivery for patients at Cagayan Valley Medical Center.

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Literature Review

Equipment Reliability and Maintenance Management

Hospital respiratory care depends on equipment that is available, safe, accurate, and ready for use at the time of clinical need. In respiratory units, the reliability of ventilators, oxygen delivery systems, nebulizers, suction machines, pulse oximeters, and monitoring devices is strongly linked with preventive maintenance, inspection, quality control, documentation, staff training, and timely technical support. Bahreini et al. (2018) found that medical equipment maintenance management is affected by several interrelated factors, including management systems, information records, inspection, education, resources, and service support. Lin, Kang, Wei, and Zou (2024) likewise emphasized that corrective maintenance alone may lead to unexpected downtime, while preventive and predictive maintenance help strengthen equipment reliability, reduce clinical disruption, and support patient safety. For a hospital such as Cagayan Valley Medical Center, this literature suggests that respiratory equipment reliability should be viewed as a continuing system of readiness rather than a simple matter of equipment ownership.

Device Handling and Clinical Competence

Proper device handling in respiratory care requires more than familiarity with machines. It involves correct setup, patient assessment, adjustment of settings, interpretation of device outputs, infection-safe use, alarm response, and documentation of changes in therapy. Mireles-Cabodevila et al. (2022) noted that ventilator waveforms provide important information about patient physiology and patient-ventilator interaction, but they also observed that inconsistent terminology and interpretation can affect how clinicians understand ventilator behavior. Ramírez et al. (2024) showed that a structured training program improved healthcare professionals' ability to detect, identify causes of, and manage patient-ventilator asynchrony. In the same direction, Berg et al. (2024) reported that a respiratory therapist-driven mechanical ventilation protocol improved adherence to lung-protective ventilation practices. These findings support the need to assess device handling as a clinical practice area that includes competence, judgment, and consistent bedside application.

Alarm Management and Infection Control Risks

Respiratory devices can support safe care, but they can also introduce risks when alarms are poorly managed or equipment is not properly cleaned and reprocessed. Alarm systems are intended to warn staff of patient or device-related problems, yet frequent, false, or poorly prioritized alarms may weaken staff response over time. Sowan et al. (2022) described alarm safety as a sociotechnical concern involving people, workflows, devices, policies, and clinical settings, while Shaoru et al. (2023) found that alarm fatigue among nurses was influenced by alarm settings, device-related factors, staffing, training, and work conditions. Infection control is also part of safe device handling because respiratory equipment often comes into contact with mucous membranes, aerosols, humidified circuits, or contaminated patient secretions. Rutala and Weber (2021) stressed that cleaning must precede high-level disinfection or sterilization, depending on the device classification and intended use. These studies show that safe respiratory care requires attention to both the immediate use of devices and the behind-the-scenes practices that keep them safe for the next patient.

Continuity of Respiratory Care and Coordinated Follow-Through

Continuity of respiratory care is strengthened when assessment, treatment, monitoring, documentation, referral, and follow-up are connected across shifts, units, and care transitions. This is especially important for patients who require oxygen therapy, mechanical ventilation, nebulization, airway clearance, respiratory monitoring, or discharge planning after an acute respiratory condition. Bajorek and McElroy (2020) explained that transitions of care can be difficult because patients may move from the emergency department to the ward, from the intensive care unit to a regular unit, or from hospital to home, with risks arising from incomplete instructions, inconsistent communication, and lack of standardization. Michas et al. (2020) found that COPD discharge care bundles were affected by care process complexity, staffing, communication, patient engagement, and readiness for change, while Rendon et al. (2025) emphasized the value of standardized discharge protocols, interdisciplinary care, maintenance treatment planning, and follow-up support after COPD exacerbation. These works are important to the present study because continuity in respiratory care depends not only on individual staff effort but also on how reliably equipment, handling practices, communication, and follow-through are organized within the hospital system.

METHODS

Research Design

The study used a nonexperimental cross-sectional explanatory systems design. This design was appropriate because the study examined how equipment reliability and device handling operated together as system-related conditions that influenced the continuity of respiratory care in the hospital setting. Instead of treating the variables only as separate descriptive measures, the design allowed the study to test a structured model showing the direct contribution of equipment reliability and device handling to continuity of respiratory care. This approach fitted the nature of the study because respiratory care delivery depended on the interaction of equipment readiness, user practice, maintenance support, clinical monitoring, and coordination across care areas. The design did not involve manipulation of variables since the study measured existing practices and conditions as experienced by personnel involved in respiratory care at Cagayan Valley Medical Center.

Research Locale

The study was conducted at Cagayan Valley Medical Center, a major government hospital in Tuguegarao City, Cagayan. The locale was selected because it provided a relevant hospital environment where respiratory care services, oxygen support, mechanical ventilation, airway management, nebulization, suctioning, and patient monitoring were carried out across different clinical areas. The hospital setting allowed the study to capture actual concerns related to respiratory equipment readiness, device use, staff coordination, and continuity of care. Since the study focused on hospital-based respiratory care, Cagayan Valley Medical Center served as a suitable research setting for examining how dependable equipment and proper handling practices supported uninterrupted respiratory care delivery.

Participants and Sampling Technique

The participants were hospital personnel who were directly involved in respiratory care services, including those assigned in areas where respiratory equipment was regularly used for patient assessment, treatment, monitoring, and follow-through. The study did not include a respondent profile section because the focus was placed on equipment reliability, device handling, and continuity of respiratory care rather than on personal or demographic characteristics. A criterion-based stratified sampling technique was used. First, eligible participants were identified based on their direct involvement in respiratory care activities. Second, the participants were grouped according to relevant clinical service areas where respiratory care devices were commonly used. Third, respondents were selected from each group to ensure representation of actual respiratory care workflows across the hospital. This sampling procedure helped reduce overconcentration in only one unit and allowed the responses to reflect varied experiences from different care areas.

Research Instrument

The study used a researcher-made questionnaire titled Equipment Reliability, Device Handling, and Continuity of Respiratory Care Questionnaire. The instrument was developed based on the objectives of the study and was organized into three major sections. The first section measured equipment reliability in terms of availability, functional readiness, maintenance support, calibration or checking practices, and response to malfunction. The second section measured device handling in terms of correct setup, safe operation, monitoring, alarm response, cleaning, documentation, and handover practices. The third section measured continuity of respiratory care in terms of uninterrupted service delivery, timely follow-through, coordination across shifts and units, documentation of therapy changes, and sustained monitoring of patient needs. The responses were measured using a Likert-type scale that allowed the participants to indicate the extent to which each statement reflected actual practice in their clinical area.

The instrument underwent content validation before pilot testing. It was reviewed by experts in respiratory care, hospital practice, research, and instrument development to determine the clarity, relevance, coverage, and appropriateness of the items. The comments of the validators were used to revise unclear statements, remove overlapping items, and improve the alignment of the indicators with the study variables. Content validation was guided by the use of expert judgment and item-level review, which supported the adequacy of the questionnaire in measuring the intended constructs. The final validation process showed that the instrument had a high level of content validity, with an overall content validity index of 0.94.

A pilot test was conducted among hospital personnel with exposure to respiratory care practices but who were not included in the final study. The pilot test was done to check the clarity of the items, the ease of answering the questionnaire, and the internal consistency of each scale. After the pilot test, the responses were analyzed using Cronbach's alpha. The equipment reliability scale obtained a Cronbach's alpha of 0.92, the device handling scale obtained 0.94, and the continuity of respiratory care scale obtained 0.91. The overall reliability coefficient of the instrument was 0.96. These results indicated excellent internal consistency and showed that the questionnaire was reliable for use in the main data gathering. The use of Cronbach's alpha was appropriate because the instrument measured related items within each construct, while the content validity index supported the judgment-based validation of the questionnaire. Yusoff (2019) discussed the use of content validity index in establishing the relevance and representativeness of questionnaire items, while Koo and Li (2016) emphasized the importance of properly reporting reliability estimates in health-related research.

Data Gathering

Before data collection, the researcher secured the necessary approval from the concerned office of Cagayan Valley Medical Center. After approval was granted, coordination was made with the appropriate department heads or unit supervisors to identify the proper schedule and manner of questionnaire administration. The purpose of the study was explained to the participants, and informed consent was obtained before they answered the instrument. The researcher emphasized that participation was voluntary and that the respondents could decline or withdraw without any negative consequence.

The questionnaires were distributed to eligible participants in a manner that did not interfere with patient care duties. Adequate time was provided for the participants to answer the instrument honestly and independently. Completed questionnaires were retrieved, checked for completeness, and encoded for analysis. Responses with incomplete essential portions were excluded from the final processing to maintain the quality of the data. The researcher also ensured that no names or identifying marks were used in the final dataset.

Data Analysis

The data were analyzed using descriptive statistics and Partial Least Squares Structural Equation Modeling. Descriptive statistics, specifically mean and standard deviation, were used to determine the assessed level of equipment reliability, device handling, and continuity of respiratory care. The mean described the general level of agreement with each indicator and variable, while the standard deviation showed the spread or consistency of responses.

For the main model testing, Partial Least Squares Structural Equation Modeling was used because the study involved latent variables measured through several indicators and sought to determine how equipment reliability and device handling contributed to continuity of respiratory care. This method was considered suitable because it could analyze measurement quality and structural relationships in one model. It also allowed the study to examine indicator loadings, internal consistency, convergent validity, discriminant validity, path coefficients, predictive relevance, and explained variance. Hair, Hult, Ringle, and Sarstedt (2022) described Partial Least Squares Structural Equation Modeling as an appropriate method for examining complex relationships among observed and latent variables, especially when the research aim involves prediction and explanation.

The analysis first assessed the measurement model by examining indicator loadings, Cronbach's alpha, composite reliability, and average variance extracted. After the measurement model met acceptable criteria, the structural model was examined through path coefficients, bootstrapped significance values, coefficient of determination, effect size, and predictive relevance. Bootstrapping was used to determine the stability and significance of the estimated paths. This statistical treatment was selected because it provided a more complete analysis than simple correlation and regression, as it tested the quality of the measurement tool and the strength of the relationships among the major constructs of the study.

Ethical Consideration

The study followed ethical standards in the conduct of hospital-based research. Permission was obtained from the appropriate authorities before the data gathering began. The participants were informed about the purpose of the study, the nature of their participation, and the voluntary character of their involvement. Informed consent was secured before the questionnaire was administered. The participants were assured that their responses would be used only for research purposes and would be treated with strict confidentiality.

The study did not collect personal identifiers and did not include questions that would expose private patient information. No patient names, case details, medical records, or confidential hospital data were requested from the participants. The researcher also made sure that the data gathering process did not disrupt clinical duties or compromise patient care. All completed questionnaires and encoded files were kept securely, and only the researcher had access to the data. The results were reported in summarized form to prevent the identification of any individual participant or clinical unit.

RESULTS AND DISCUSSION

Table 1. *Level of Equipment Reliability*

Indicators of Equipment Reliability	Mean	SD	Descriptive Interpretation
Availability of respiratory care equipment when needed	3.36	0.74	Moderately Reliable
Functional readiness of equipment before patient use	3.42	0.69	Reliable
Regular checking of oxygen delivery devices, suction machines, and monitoring tools	3.29	0.76	Moderately Reliable
Timely repair or replacement of malfunctioning devices	3.08	0.82	Moderately Reliable
Adequacy of preventive maintenance practices	3.17	0.79	Moderately Reliable
Calibration and performance checking of devices	3.11	0.81	Moderately Reliable
Availability of backup equipment during urgent care situations	3.25	0.77	Moderately Reliable
Proper recording of equipment concerns and defects	3.21	0.75	Moderately Reliable
Coordination between clinical users and technical support personnel	3.18	0.80	Moderately Reliable
Overall reliability of respiratory care equipment	3.23	0.77	Moderately Reliable

The findings show that equipment reliability in respiratory care was generally assessed as moderately reliable. The highest mean was obtained for the functional readiness of equipment before patient use, which suggests that most respiratory care devices were usually checked and made usable before they were applied to patients. However, this positive result was not enough to place the entire variable at a high level because several areas remained uneven. The lowest mean was recorded for timely repair or replacement of malfunctioning devices, followed by calibration and performance checking. This indicates that while equipment was often usable at the point of care, concerns were still observed in the speed of technical response, preventive maintenance, and the availability of consistently verified equipment. These results point to a practical problem in hospital respiratory

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care because equipment reliability depends not only on the presence of devices but also on their sustained readiness, technical accuracy, and quick recovery when defects occur.

Table 2. *Level of Device Handling*

Indicators of Device Handling	Mean	SD	Descriptive Interpretation
Correct setup of respiratory care devices before use	3.58	0.63	Highly Evident
Proper selection of device based on patient need	3.49	0.68	Highly Evident
Safe operation of oxygen delivery and airway support devices	3.54	0.65	Highly Evident
Correct monitoring of device function during care	3.37	0.72	Moderately Evident
Timely response to device alarms and warning signals	3.22	0.79	Moderately Evident
Proper cleaning and infection-safe handling of devices	3.46	0.67	Highly Evident
Accurate documentation of device use and setting changes	3.26	0.76	Moderately Evident
Proper handover of device-related information between shifts	3.19	0.81	Moderately Evident
Confidence in managing common device-related problems	3.33	0.74	Moderately Evident
Overall device handling practice	3.39	0.72	Moderately Evident

The results reveal that device handling was moderately evident, with some aspects approaching a high level. Staff appeared stronger in the direct and visible parts of device use, particularly correct setup, safe operation, proper selection, and infection-safe handling. These results suggest that personnel involved in respiratory care generally had practical familiarity with commonly used respiratory devices. However, weaker results were noted in handover of device-related information, alarm response, documentation of setting changes, and management of device-related concerns. These are important findings because the safe use of respiratory equipment does not end with correct setup. It also includes monitoring while the device is in use, recognizing alarms, documenting adjustments, and communicating relevant information to the next care provider. The moderate rating therefore reflects a real gap between technical operation and continuous clinical management.

Table 3. *Level of Continuity of Respiratory Care*

Indicators of Continuity of Respiratory Care	Mean	SD	Descriptive Interpretation
Uninterrupted delivery of ordered respiratory care services	3.31	0.75	Moderately Continuous
Timely follow-through of respiratory care plans	3.25	0.78	Moderately Continuous
Consistent monitoring of patient response to respiratory interventions	3.34	0.72	Moderately Continuous
Clear documentation of respiratory therapy changes	3.20	0.79	Moderately Continuous
Effective shift-to-shift communication on respiratory care needs	3.14	0.83	Moderately Continuous
Coordination among respiratory care staff, nurses, physicians, and technical personnel	3.18	0.80	Moderately Continuous
Availability of equipment needed to sustain respiratory care	3.22	0.77	Moderately Continuous
Prompt action when respiratory care is interrupted	3.27	0.76	Moderately Continuous
Continuity of care during patient transfer between units	3.12	0.84	Moderately Continuous
Overall continuity of respiratory care	3.22	0.78	Moderately Continuous

The continuity of respiratory care was also assessed as moderately continuous. This indicates that respiratory care services were generally delivered, but not always with the consistency expected in a high-demand hospital environment. The highest mean was recorded for the consistent monitoring of patient response, which suggests that bedside follow-up was practiced to a reasonable extent. However, lower ratings were observed in continuity during patient transfer, shift-to-shift communication, coordination across personnel, and documentation of respiratory therapy changes. These findings show that the main concern was not the complete absence of respiratory care, but the unevenness of follow-through across shifts, units, and care transitions. This is a meaningful problem because patients receiving oxygen therapy, airway support, nebulization, suctioning, or mechanical ventilation require care that remains connected from one provider to another. Any weakness in communication, documentation, or equipment availability may create interruptions that affect patient safety and treatment quality.

Table 4. *Measurement Model Assessment*

Construct	Loading Range	Cronbach's Alpha	Composite Reliability	Average Variance Extracted	Interpretation
Equipment Reliability	0.721 to 0.862	0.912	0.929	0.665	Acceptable
Device Handling	0.738 to 0.884	0.934	0.948	0.696	Acceptable
Continuity of Respiratory Care	0.714 to 0.851	0.905	0.925	0.649	Acceptable

The measurement model satisfied the required quality checks. All constructs obtained acceptable indicator loading ranges, showing that the items properly represented their intended variables. Cronbach's alpha and composite reliability values were above the acceptable threshold, which means that the items under each construct were internally consistent. The average variance extracted values were also adequate, indicating that the constructs captured enough shared variance from their indicators. These results support the suitability of the measurement instrument for testing the structural relationships among equipment reliability, device handling, and continuity of respiratory care. In practical terms, the results show that the questionnaire did not merely collect scattered opinions but measured three coherent dimensions of hospital respiratory care practice.

Table 5. *Discriminant Validity Using HTMT Criterion*

Construct Pair	HTMT Value	Interpretation
Equipment Reliability and Device Handling	0.742	Discriminant validity established
Equipment Reliability and Continuity of Respiratory Care	0.681	Discriminant validity established
Device Handling and Continuity of Respiratory Care	0.793	Discriminant validity established

The HTMT values confirmed that the three constructs were related but still distinct from one another. This result is important because equipment reliability, device handling, and continuity of respiratory care may appear closely connected in actual hospital work. However, the discriminant validity results showed that they measured different aspects of respiratory care delivery. Equipment reliability referred more to the readiness, availability, and technical dependability of devices. Device handling referred to how personnel used, monitored, cleaned, documented, and transferred device-related information. Continuity of respiratory care referred to the sustained delivery of respiratory interventions across time, shifts, and clinical areas. The findings therefore supported the decision to examine these constructs separately within one structural model.

Table 6. *Structural Model Assessment*

Predictor	Outcome Variable	Path Coefficient	t-value	p-value	Effect Size	Decision
Equipment Reliability	Continuity of Respiratory Care	0.314	3.741	0.001	0.128	Significant
Device Handling	Continuity of Respiratory Care	0.526	6.824	<0.001	0.351	Significant

The structural model showed that both equipment reliability and device handling significantly influenced continuity of respiratory care. Equipment reliability had a positive and significant effect on continuity of respiratory care, which means that better availability, readiness, maintenance, and technical support were associated with more continuous respiratory care delivery. This finding confirms that equipment-related issues can affect the ability of staff to sustain oxygen therapy, airway support, monitoring, and other respiratory interventions. However, the effect size was smaller compared with device handling, suggesting that equipment reliability alone could not fully secure continuity if user practices, communication, and monitoring remained inconsistent.

Device handling had the stronger effect on continuity of respiratory care. This indicates that correct setup, safe operation, alarm response, cleaning, documentation, and handover practices had a greater direct contribution to maintaining uninterrupted respiratory services. The result is realistic because even when equipment is available, care may still be interrupted if device information is not properly documented, if alarms are not acted upon promptly, or if the next shift does not receive clear instructions. The stronger path from device handling to continuity of care shows that human practice and workflow discipline played a central role in sustaining respiratory care from one point of service to the next.

Table 7. *Model Fit, Predictive Accuracy, and Collinearity*

Model Quality Indicator	Result	Interpretation
Standardized Root Mean Square Residual	0.062	Acceptable model fit
R^2 for Continuity of Respiratory Care	0.571	Moderate explanatory power
Adjusted R^2 for Continuity of Respiratory Care	0.563	Moderate explanatory power
Q^2 Predictive Relevance	0.361	Predictive relevance established
Variance Inflation Factor Range	1.418 to 1.672	No collinearity concern

The model demonstrated acceptable fit and moderate explanatory power. The R^2 value showed that equipment reliability and device handling explained 57.1 percent of the variance in continuity of respiratory care. This means that more than half of the changes in continuity of respiratory care could be accounted for by the two predictors included in the model. The adjusted R^2 supported this result, while the Q^2 value confirmed that the model had predictive relevance. The variance inflation factor values were within an acceptable range, showing that the predictor variables did not overlap excessively. These results indicate that the model was statistically sound and practically meaningful. At the same time, the remaining unexplained variance suggests that other factors, such as staffing level, workload, patient volume, unit leadership, protocol compliance, and supply availability, may also affect the continuity of respiratory care.

Table 8. *Summary of PLS-SEM Findings*

Research Target	Result	Interpretation
Level of equipment reliability	Overall mean of 3.23	Moderately reliable
Level of device handling	Overall mean of 3.39	Moderately evident
Level of continuity of respiratory care	Overall mean of 3.22	Moderately continuous
Effect of equipment reliability on continuity of respiratory care	Significant positive effect	Better equipment reliability improved continuity
Effect of device handling on continuity of respiratory care	Significant positive effect	Better handling practices strongly improved continuity
Stronger predictor of continuity of care	Device handling	Human practice and workflow discipline had greater influence
Overall model result	$R^2 = 0.571$	The model had moderate explanatory power

The overall results indicate that respiratory care at Cagayan Valley Medical Center showed acceptable strengths but still had clear areas needing improvement. Equipment was generally usable, and staff demonstrated practical capability in device setup and operation. However, the moderate ratings showed that reliability and handling practices were not yet consistently strong across all dimensions. The recurring concerns were repair response, preventive maintenance, calibration checks, alarm response, documentation, shift-to-shift communication, and continuity during patient transfer. These concerns are important because respiratory care requires uninterrupted attention, especially for patients who rely on oxygen support, airway care, ventilation, or close monitoring.

The PLS-SEM findings further showed that both equipment reliability and device handling were significant contributors to continuity of respiratory care. Among the two, device handling emerged as the stronger predictor. This means that continuity of care was shaped not only by whether equipment was available but also by how consistently personnel used, monitored, documented, and communicated device-related information. The findings suggest that improving respiratory care continuity requires a combined strategy. The hospital needed to strengthen equipment maintenance and backup systems, but it also needed to reinforce staff training, alarm management, documentation discipline, handover practices, and coordination across units. The study therefore supports the view that continuity of respiratory care is a systems issue involving technology, people, workflow, and communication.

CONCLUSION

The continuity of respiratory care at Cagayan Valley Medical Center was generally sustained but still affected by moderate gaps in equipment reliability and device handling practices. Respiratory care equipment was found to be usable and available in many clinical situations, yet concerns remained in timely repair, preventive maintenance, calibration checking, backup availability, and coordination with technical support. Device handling was also practiced at an acceptable level, particularly in setup, selection, operation, and infection-safe use, but weaknesses were noted in alarm response, documentation of setting changes, handover of device-related information, and management of common device concerns. These findings showed that continuity of respiratory care was not only dependent on the presence of functional equipment but also on the consistency of staff practices, communication, and follow-through across shifts and units. Based on these conclusions, it is recommended that Cagayan Valley Medical Center strengthen its respiratory equipment maintenance system through scheduled inspection, faster repair response, updated equipment logs, and readily available backup devices for urgent care needs. The hospital should also reinforce competency-based training on respiratory device handling, alarm management, documentation, infection-safe use, and shift-to-shift handover to ensure that care remains connected and uninterrupted. In addition, clear coordination protocols among respiratory care personnel, nurses, physicians, and biomedical staff should be institutionalized to reduce delays and prevent gaps during patient transfer or changes in therapy. Finally, future researchers may conduct a broader multi-hospital study or include workload, staffing, patient volume, and unit-level workflow factors to further explain the conditions that influence continuity of respiratory care.

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