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Participation in Scientific Activities as a Driver of Sustainable Nursing Education: An Educational Management Perspective from Minahasa Regency, Indonesia

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ABSTRACT

Continuing nursing education is a crucial element in maintaining nurses' professional competence amidst the dynamic development of health sciences and demands for quality services. One form of implementation of continuing professional development is participation in scientific activities such as seminars, workshops, and training, which play a role in updating knowledge and improving clinical practice skills. However, nurses' involvement in scientific activities is determined not only by individual motivation but also by the support of the educational management system within healthcare organizations. This study aims to analyze how nurses' participation in scientific activities contributes to the sustainability of nursing education from an educational management perspective in Minahasa Regency. The results indicate that participation in scientific activities is an important indicator in strengthening the ecosystem of continuous professional learning, especially when supported by organizational policies, educational leadership, and access to competency development programs. This finding aligns with global studies that confirm that continuing professional development has a significant relationship with improved clinical competence, service quality, and patient safety. Furthermore, institutional support and a learning organizational culture have been shown to play a role in increasing nurses' engagement in professional development activities. Thus, participation in scientific activities should be viewed as an integral part of a continuing nursing education management strategy that is oriented not only toward improving individual competence but also toward strengthening the professional education system within the context of regional healthcare services.

Keywords: continuing professional development, educational management, healthcare workforce development, nursing professional development, scientific participation, sustainable nursing education.

INTRODUCTION

Continuing nursing education is an essential component in maintaining the quality of healthcare services amidst the increasingly complex dynamics of the global healthcare system. Nurses, as frontline healthcare workers, are required to continuously update their clinical competencies, scientific knowledge, and decision-making skills through continuing professional development (CPD) mechanisms. Internationally, CPD is viewed not merely as an administrative obligation, but as a strategic strategy to ensure patient safety, improve service quality, and strengthen healthcare workers' adaptability to changes in evidence-based practice (Filipe et al., 2014; Reeves et al., 2017). Global reports also emphasize that investment in continuing education for nursing staff is a key determinant of health system sustainability (World Health Organization, 2020).

Participation in scientific activities such as seminars, workshops, and training is one concrete form of CPD implementation. Active involvement in scientific activities has been shown to correlate with increased clinical reflection, evidence-based practice, and professional competence among nurses (Aiken et al., 2014). Furthermore, a work environment that supports continuous learning has a significant relationship with the quality of nursing care and patient safety. However, the literature also shows that nurses' participation in CPD is not solely influenced by individual motivation but is highly dependent on organizational support, leadership, and managerial policies that integrate learning into the work system (Mlambo et al., 2021). From an educational management perspective, continuing nursing education should ideally be designed as a structured, inclusive system that is oriented towards both organizational and individual needs. Effective CPD focuses not only on the accumulation of credits or certificates but also on the ability to generate tangible changes in clinical practice (Filipe et al., 2014). Global studies indicate that key barriers to CPD participation include high workloads, time constraints, limited institutional support, and unequal access to training (Shahhosseini & Hamzehgardeshi, 2015). Without structural support, continuing education tends to be sporadic and dependent on individual initiative.

This situation is relevant to preliminary research findings in Minahasa Regency, which showed that nurses' participation in scientific activities still relies heavily on external invitations and personal initiative, and has not been fully integrated into the regional competency development management system. Although there is a regulatory requirement to fulfill training hours as part of civil servant development, implementation in the field shows variations in participation influenced by organizational factors such as leadership support, budget allocation, and the relevance of training to health service programs. This reflects a gap between formal policies and managerial practices for continuing education at the primary care level. On the other hand, several health care units in Minahasa have demonstrated positive practices such as scheduling support, internal knowledge sharing, and the use of digital learning platforms to increase access to training. These findings align with international studies that confirm that organizational-based learning and communities of practice can strengthen knowledge transfer and enhance the impact of continuing education on service quality

(Reeves et al., 2017). However, budget constraints and a program-oriented training approach have the potential to create competency disparities among nurses if not balanced with strategies to equalize access.

One fundamental issue in strengthening continuing nursing education is the limited participation of nurses in scientific activities such as seminars, workshops, and training, which are essential components of continuing professional development (CPD). Conceptually, CPD plays a crucial role in maintaining clinical competence, adapting to scientific developments, and continuously improving the quality of healthcare services (Pracilio et al., 2023). However, various international studies have shown that nurses' involvement in professional development activities is often hampered by managerial factors such as high workloads, limited institutional support, financial constraints, and the lack of organizational policies that systematically promote a culture of lifelong learning (Zhang et al., 2022). Even in a global context, structural barriers such as lack of time, high costs of scientific activities, and weak organizational communication systems regarding professional development opportunities have been shown to contribute to low participation of nursing staff in scientific activities (JICRCR, 2024). This situation suggests that participation issues are not solely individual issues, but are closely related to educational governance and management support in healthcare organizations. In the context of Minahasa Regency, this situation is crucial to examine because the sustainability of nursing education is determined not only by the availability of development programs, but also by how the educational management system facilitates nurses' active involvement in scientific activities as part of a strategy to continuously improve professional capacity and the quality of healthcare services.

In the global landscape of nursing education, Continuing Professional Development (CPD) has been recognized as a key element in maintaining clinical competence, professionalism, and the quality of healthcare services. CPD is understood as a lifelong learning process that requires nurses to actively participate in various scientific activities such as seminars, training, conferences, workshops, and other academic forums that contribute to the improvement of knowledge and practical skills (Yu et al., 2022). Involvement in these scientific activities has been shown to have a direct impact on the quality of care, patient safety, job satisfaction, and retention of nursing personnel in healthcare organizations (Walshe et al., 2018; Steven et al., 2018). Recent literature indicates that despite CPD's strategic contribution to improving nurses' competence and performance, the level of participation in scientific activities remains problematic in various countries. Several studies have revealed that nurses are not always actively involved in professional development activities due to structural barriers such as limited time, organizational support, access to scientific activities, and clinical workload (Ni et al., 2014; Onyango, 2013). In fact, in the context of a dynamic modern healthcare system, the mismatch between competency development needs and available CPD activities often leads to low participation of nursing staff in scientific activities relevant to their clinical practice. Other studies emphasize that participation in CPD is strongly influenced by organizational factors such as a learning culture, managerial support, and the availability of institutional policies that encourage professional engagement in scientific activities (Price & Reichert, 2017). In other words, nurses' involvement in seminars, workshops, and training is not solely an individual responsibility but also a result of educational governance and human resource management within the healthcare system. Recent research also shows that nurses' perceptions of the benefits of CPD significantly influence their level of participation. A positive attitude toward professional development does not always translate directly into actual engagement in scientific

activities if it is not supported by a conducive work environment and clear organizational policies. This confirms that participation in scientific activities is a multidimensional phenomenon influenced by the interaction between individual, organizational, and professional education system factors.

Although various international studies have examined CPD from the perspective of motivation, learning needs, and its impact on clinical performance, there remains a gap in research examining nurses' participation in scientific activities from an educational management perspective, particularly in local contexts such as districts. Most studies focus on hospitals or national health systems, while the dynamics of participation in the context of administrative regions like Minahasa, which have unique social, organizational, and policy characteristics, have not been explored in depth. Therefore, this study is strategically positioned to broaden our understanding of how nurses' participation in scientific activities can be viewed not merely as an individual development activity but as an integral part of a regional continuing nursing education management system.

The novelty of this research lies in shifting the perspective of nurses' continuing professional development from an individual, competency-based approach to a systemic approach based on nursing education management rooted in the local context. To date, global literature on continuing professional development (CPD) in nursing has generally focused on individual perceptions, personal motivation, barriers to participation, and work-related factors such as role conflict or workload (Yu et al., 2022; Aljadir et al., 2025). Previous research indicates that nurses' participation in scientific activities such as training or seminars is primarily understood as an individual professional responsibility to maintain clinical competence and practice safety (Yu et al., 2022), or as part of lifelong learning to ensure knowledge renewal (Aljadir et al., 2025). However, these approaches have not adequately explained how regional education management systems influence the sustainability of nurses' participation in scientific activities. This study offers novelty by positioning nurses' participation in seminars, workshops, and training not simply as individual CPD activities, but as strategic indicators of the sustainability of the nursing education ecosystem, influenced by organizational support, local policies, and educational management practices at the healthcare institution level. This is important because previous research also indicates that participation in CPD is strongly influenced by structural factors such as managerial support and ease of program access (Mustapa et al., 2021), but has not yet examined in depth its relationship to the regional continuing education management framework. Therefore, the novelty of this study lies in the integration of the dimensions of nurses' scientific participation and the educational management perspective as a driving mechanism for the sustainability of nursing education in the regional context, specifically Minahasa Regency. This approach opens up a new analytical space that views scientific activity not merely as a professional obligation but as part of a nursing capacity-building strategy based on sustainable education governance.

Conceptually, this situation demonstrates that continuing nursing education at the regional level is not only a professional issue but also an educational management issue. An appropriate managerial approach is needed to transform nurse participation from merely fulfilling administrative obligations to a culture of continuous professional learning. Therefore, understanding how participation in scientific activities contributes to strengthening continuing nursing education is crucial, particularly within the context of the regional health system.

This study aims to analyze nurse participation in scientific activities as a driver of continuing nursing education from an educational management perspective in Minahasa Regency. This study is

expected to provide a conceptual contribution to the development of a more systematic, inclusive, and oriented model for continuing nursing education management that improves the quality of healthcare services.

METHOD

Type of Research

This study employed qualitative research methods, utilizing both primary and secondary data. Primary data were obtained through in-depth interviews, which aimed to delve deeper into informants' general opinions and the underlying reasons behind them. Secondary data were obtained through observation. Qualitative research focused on continuing nursing education aims to understand nurses' experiences and perspectives regarding their educational programs. Through this approach, researchers can explore how nurses interpret the importance of continuing education in improving their skills and knowledge (Ben Natan et al., 2021). Methods frequently used in this research include in-depth interviews and focus group discussions, which provide nurses with the opportunity to share their stories and perspectives in depth (McCoy & Theeke, 2020). This study begins with background information explaining the relevance of continuing education in the context of nursing practice (O'Brien & O'Connor, 2019).

This research is rooted in a scientific background as a whole, relies on humans as research tools, analyzes data inductively, directs research towards efforts to find basic theories that are descriptive, prioritizes the process rather than the results, limits the study with focus, has a set of criteria to check the validity of the data and the research design is temporary and the results of the research are agreed upon by both parties, both researchers and research subjects (Moleong, 2017). This qualitative method is used because of several thoughts as put forward by Moleong (2017) first, the inductive process is more able to find multiple realities as contained in the data, second, inductive analysis is more able to create relationships between researchers and informants, third, this method is more sensitive and more adaptable to many sharpening of shared influences and to the value patterns faced.

Research Location and Time

The research will be conducted at a community health center in Minahasa Regency. The study is planned for a three-month period, from May 2025 to July 2025. The research timeframe may change depending on the situation and natural conditions prevailing during the study.

Research Population and Subjects

The population in this study consisted of 534 nurses working in 23 Community Health Centers (Puskesmas) in Minahasa Regency, with a breakdown of 58 nurses, 192 D4 (D4), 193 D3 (D3), 73 S1 (S1), 10 S2 (S2) (related), no S3 (S3), no Linear S2, 1 D1 (D1), and 4 SPK (Minahasa Health Office, 2023).

The method for selecting subjects in this study was as follows table 1.

Table 1. Population and Subjects

No	Informant	Agency	Rank	Information

1	Head of Health Service	Minahasa Regency Health Office		1 person
2	Chairman of PPNI	Minahasa Regency		1 person
3	Head of the Community Health Center	Health Center with Full Accreditation Status		1 person
4	Head of the Community Health Center	Primary Accreditation Status of Health Center		1 person
5	Head of the Community Health Center	Community Health Center with Intermediate Accreditation Status		1 person
6	Nurse	Community Health Center	Group 2	2 persons
7	Nurse	Community Health Center	Group 3	2 persons
8	Nurse	Community Health Center	Group 4	2 persons
Number of Informants				11 persons

The selection of nurse informants for this study was based on predetermined criteria. The inclusion and exclusion criteria are as follows:

a. Inclusion Criteria

Inclusion criteria are criteria that determine whether a research subject can be representative of the research sample and meet the requirements for inclusion.

The inclusion criteria for this study are as follows:

1) Nurses who have worked for more than 5 years.
2) Nurses working in community health centers.
3) Willingness to be a research subject.
4) Civil servant nurses.

b. Exclusion Criteria

Exclusion criteria are criteria that determine whether a research subject cannot be representative of the sample because they do not meet the requirements for inclusion.

The exclusion criteria for this study are as follows:

1) Nurses working in hospitals.
2) Nurses working in health departments or other agencies.
3) Unwillingness to be a research subject.

Data Collection Stages and Techniques

a. Data Collection Stage

The primary instrument in this study was the researcher herself, who directly observed the field with her own eyes and heard with her own ears (Rosyada, 2020). Primary data was obtained from in-depth interviews with informants using an in-depth interview guide. In-depth interviews were conducted using a list of questions in the in-depth interview guide, and the results were recorded and recorded. Interviews were conducted at an appropriate time so that the research subjects felt unburdened and undemanding, thus maintaining the integrity of the data. Secondary data was obtained

through overt or covert observation. In this case, the researcher openly stated to the data sources that they were conducting research during data collection. Those being studied were aware of the researcher's activities from beginning to end. The researcher also sometimes acted in a less overt or covert manner during observations to avoid confidentiality. In addition to overt observation, document observation was also conducted using an observation guide.

The research procedure, based on Nasution (2023), was detailed in three stages:

a) Orientation Stage

The researcher conducted the following activities at this stage:

1) Observing nurses in 23 community health centers in Minahasa Regency
2) Identifying and defining issues deemed important in determining the focus of the problem
3) Searching for relevant literature based on the results of the problem assessment
4) Reading and reviewing various references related to the research focus before and after the research proposal seminar, under the guidance of the supervisor

b) Exploration Stage

After the research proposal seminar, the supervisor sought guidance on various activities related to the research. The researcher then requested a cover letter to conduct a survey/field research with nurses in the community health centers in Minahasa Regency. Activities carried out at this stage:

1) Conducting observations, interviews, and documentation using data sources related to the focus problem, as well as conducting a documentation study.
2) Taking field notes.
3) Analyzing field notes.

c) Member check stage.

Activities carried out by researchers at this stage include:

1) Refining the results of the initial analysis in the form of an interim report.
2) Duplicating the analysis results and asking informants for feedback.
3) Recording and analyzing new information provided by informants.
4) Making improvements based on existing corrections.

Data Collection Techniques

The researcher used several techniques to collect and record data, as follows (Sugiyono, 2027):

1) Interview Technique

The interview technique used in this study was a semi-structured interview using a recording device (cell phone) and questionnaires to answer the questions posed. Multiple interviews were conducted if the researcher encountered data requiring confirmation from informants to ensure objectivity and credibility.

The researcher used to obtain interview data by visiting the informants and providing a brief explanation of the purpose and objectives of the study. Furthermore, the researcher explained several key points about the procedures to be discussed during the interviews.

2) Observation Technique

The researcher visited the community health center in person according to the research schedule. During the visit, observations were made covering all aspects of events related to nurses' continuing nursing education. Observation results are recorded in field notes.

3) Documentation

Documentation of the results of this research study consists of written documents related to the research problem, such as:

a) Implementation of nursing care by nurses
b) Certificates of participation in scientific activities
c) Results of scientific development
d) Evidence of community service

Data Analysis Techniques

The collected data was processed manually by transcribing, then organized into a matrix, and then analyzed using the content analysis method developed by Sugiyono (2014). This interactive model employed the following steps:

a. Reading, reviewing, and studying the data more thoroughly.

This technique involved reading all the interview data about the continuing nursing education being studied, highlighting any important findings. The researcher sought a rational relationship between the interview results and the observations and document studies conducted.

b. Data Reduction

Data reduction means summarizing, selecting the main points, focusing on important points, and searching for themes and patterns. Thus, the reduced data will provide a clear picture and facilitate further data collection and further retrieval if needed.

c. Data Presentation

The reduced data is presented in narrative form.

d. Analyzing the Components of Research Results

The analysis of the components of research results using a content analysis approach involves comparing the research results with existing theories in the literature.

Data Validity Testing

The obtained data was analyzed, examined, and tested for validity and reliability through three stages of testing, as outlined by Sugiyono (2017):

a) Method Triangulation

Using various data collection methods, such as interviews, questionnaires, and observations, to provide consistent results.

b) Source Triangulation

Gathering data from different sources using the same technique. Using multiple data sources to obtain more comprehensive information. For example, data can be obtained from interviews, observations, and documents.

c) Researcher Triangulation

Involving multiple researchers in the data collection and analysis process to reduce individual bias.

RESULTS AND DISCUSSION

Analysis by the Head of the Minahasa Regency Health Office

Based on interviews, information was obtained regarding nurses' participation in seminars, workshops, and training in Minahasa Regency, as follows:

> *"Seminars are based on invitations, for example, from the health office, or there are also individuals who participate at the ministry level through the One Healthy Platform. So, it's up to each individual whether to participate. (YM)"*

The results of this study indicate that the continuing nursing education policy still appears to be optional and individualized, rather than integrated as part of the professional capacity management system at the regional health organization level. According to the respondent, who is the head of the Minahasa Regency Health Office, nurses' participation in seminars, workshops, or training often depends on external invitations (for example, from the Provincial Health Office or the Ministry of Health) and the nurses' own personal initiative to participate in national-level activities such as the Healthy Training Forum (an internal government seminar organizer). This pattern indicates that there is no formal mandate or comprehensive strategy from the Minahasa Regency government that encourages or requires the active participation of nurses in ongoing continuing education.

Continuing education policies should not rely solely on invitations and personal initiative, but should be supported by an organizational structure that ensures every nurse has access, work time, and financial support to regularly participate in seminars, workshops, and training sessions relevant to their professional development. The absence of this mechanism has the potential to create competency disparities among nurses, particularly between those who are personally proactive and those who lack the network support or opportunity to attend the same activities. Education management at the district level needs to formulate a formal policy that establishes seminars, workshops, or training sessions as part of structured continuing professional development (CPD) and directly relates to the clinical practice needs of nurses in Minahasa. Without this, education policies tend to be reactive to external invitations, and their impact on the quality of nursing services is limited.

The results of this study suggest that nurses' participation in seminars and training is strongly influenced by individual initiative, rather than by institutional policies that systematically regulate CPD. Interested nurses will attend national or ministerial seminars, but these activities are not yet coordinated as part of a systematic professional competency development strategy within their own workplaces. This means many nurses may not have equal opportunities to update their knowledge and expand their professional skills.

Motivation and organizational support are key determinants of nurses' participation in CPD. These findings suggest that personal factors such as individual motivation and professional needs are drivers of participation, but organizational support, resource availability, and CPD support structures are crucial for nurses' successful participation throughout their careers (Mohsen & Mahdi, 2025). Without these policies and structural support, CPD tends to be a sporadic activity dependent on individual preferences or external opportunities. Furthermore, continuing nursing education encompasses more than just seminars, but also workshops, hands-on training, and reflective activities designed to strengthen clinical competency and decision-making. A study by BMC Medical Education, using a participatory action research approach, showed that when educational programs were designed

with the active participation of nurses and other stakeholders, participant satisfaction and program quality significantly improved (satisfaction results before implementation versus during and after the intervention) (Shahhosseini & Hamzehgardeshi, 2015). This suggests that a policy model that directly involves nurses in designing seminar and training content can be more effective in increasing participation and the quality of learning.

However, structural and organizational barriers often hinder CPD participation. These barriers include time constraints, high workloads, and lack of superior support and facilities for continuing education (Shahhosseini & Hamzehgardeshi, 2015). This situation is relevant to the conditions in Minahasa Regency, where participation is still driven by external opportunities and not as part of a mandated agenda from the District Health Office.

Other research supports the finding that personal motivation to improve competency is often the primary reason nurses attend seminars or training, but organizational factors determine whether these opportunities are widely utilized by nursing staff. A scoping review concluded that the success of CPD depends largely on access to resources, managerial support, and opportunities provided by the organization in which nurses work, not just on the nurses' own initiative (Shahhosseini & Hamzehgardeshi, 2015). Furthermore, participatory studies, such as one conducted in Iran, have shown that when CPD is designed through active collaboration between nurses, management, and other stakeholders, program quality and participation rates improve. This approach resulted in significant improvements in educational quality scores and participant satisfaction, suggesting that nurses' active involvement in the educational process and program evaluation can foster better participation and outcomes (Mohsen & Mahdi, 2025).

Other literature also indicates that barriers such as workload, time constraints, limited institutional support, and lack of content relevance to nurses' needs are often reasons for low participation in CPD (Shahhosseini & Hamzehgardeshi, 2015). This is consistent with conditions in Minahasa Regency, which appears to rely on self-directed participation rather than formal CPD support mechanisms.

Analysis by the Head of the Minahasa Regency Health Office

Based on the interviews, the following information was obtained regarding nurses' participation in seminars, workshops, and training in Minahasa Regency:

As the Head of the Office, how do nurses participate in scientific activities such as seminars, workshops, and training in Minahasa Regency?

> *"For nurses' participation, there are two forms of training: technical and non-technical. Training that emphasizes professionalism means technical training in accordance with the profession, as well as non-technical training. Training for civil servants (ASN) is required to meet standards, namely 20 hours of class time to improve their competency, including for nursing professionals.*
>
> *If the training is self-taught or highly motivated by nurses, there tends to be little participation. Nurses may feel bored, or the workload is excessive, or they feel they have reached their comfort zone and have sufficient nursing knowledge. Finally, interest in improving competency depends on the individual nurse.*

The Minahasa District Health Office strives to implement training programs that involve nurses as active participants. This is especially true with the Satu Sehat (One Healthy) LMS, which allows for immediate certification, even including SKP (Student Competency Assessment) scores. However, with limited budgets, not all nurses can participate. Only those with established programs related to pregnant women and neonates, or programs for specific diseases such as TB, rabies, and immunization, can participate. These trainings require technical personnel who must master their competencies. Therefore, directly initiated scientific seminars are still lacking. (DOC)"

Based on an interview with the Head of the Minahasa Regency Health Office, nurses' participation in scientific activities and training shows a structural-administrative pattern, not yet fully based on intrinsic motivation and a strong scientific culture. Regulatory requirements require nurses as civil servants (ASN) to meet competency development standards of at least 20 hours of instruction per year. This demonstrates a formal policy framework for continuing education. Furthermore, the Health Office has facilitated technical and non-technical training and utilized Learning Management System (LMS) platforms such as Satu Sehat, which integrates certifications and SKP. From an educational management perspective, this reflects a relatively progressive learning system and infrastructure.

However, several strategic obstacles remain. First, nurse participation tends to depend on formal assignments and program requirements, rather than personal initiative. The Head of the Office identified boredom, high workloads, and a tendency to feel competent as factors that reduce interest in participating in scientific activities independently. These findings are consistent with research by Mlambo et al. (2021) in BMC Nursing, which showed that intrinsic motivation and organizational support are the main determinants of nurse participation in continuing professional development (CPD). Without an organizational culture that encourages continuous learning, scientific activities tend to be viewed as administrative obligations, rather than professional needs.

Second, budget constraints lead to prioritization of training for strategic programs such as maternal and child health, tuberculosis, rabies, or immunization. This approach makes sense from the perspective of managerial efficiency and the achievement of health program indicators. However, conceptually, it can create competency disparities among nurses. The literature emphasizes that an effective CPD system must be inclusive and based on individual and organizational needs, not solely on projects or priority programs (Filipe et al., 2014). When access to training is limited to certain groups, competency equity is hampered and the potential for professional stagnation increases.

Third, low participation in scientific seminars on personal initiative indicates that a culture of scholarly practice has not yet been established. Globally, nurses who are actively involved in scientific activities tend to have better levels of clinical reflection and application of evidence-based practices (Aiken et al., 2014). Participation in seminars and workshops is not simply the accumulation of SKP (Certificate of Competency Assessment), but rather part of the formation of a professional identity that adapts to scientific developments.

From an educational management perspective, the situation in Minahasa Regency can be categorized as a compliance-based CPD model, namely competency development driven by regulations and program requirements. This model has strengths in terms of control and standardization, but risks weaknesses in transforming a learning culture. Compared with practices in developed countries, where

CPD is often integrated into performance appraisal systems, clinical mentoring, and competency-based career paths, the system in Minahasa remains predominantly based on episodic training.

The WHO (2020) in its State of the World's Nursing report emphasized that investment in continuing education must be accompanied by clear retention strategies, leadership, and career development pathways. Without these, training becomes merely a short-term activity with no systemic impact on service quality. In the Minahasa context, the use of an LMS is a step forward, but it needs to be integrated with a learning outcomes monitoring system, evaluation of the impact on clinical practice, and ongoing development at the community health center level.

This study's findings indicate that the primary challenge is not the lack of training programs, but rather participation management, equitable access, and the establishment of a culture of lifelong learning. Strategies that could be considered include developing performance-based incentives, integrating CPD into civil servant performance assessments, strengthening communities of practice at the district level, and mentoring by senior nurses or specialists. This approach would shift the paradigm from simply fulfilling 20 annual training programs to an organizational learning system oriented toward quality and professionalism. Overall, nurse participation in scientific activities in Minahasa Regency has been structurally facilitated by the Health Office, but participation remains selective and administrative. To achieve international standards for effective CPD, a managerial transformation is needed that emphasizes intrinsic motivation, equitable access, and the integration of training outcomes into daily clinical practice.

Analysis Results from the Head of the Kombi Community Health Centre in Minahasa Regency

Based on the interview results, the following information was obtained regarding the enthusiasm of nurses at this Community Health Center for participating in seminars or training:

How enthusiastic are nurses at this Community Health Center for participating in seminars or training?

> *"We fully support staff who wish to participate in training. We typically schedule them to ensure the health center's services are available. The enthusiasm is quite positive, especially if the training is relevant to their programs. We also frequently hold internal sharing sessions or small discussions if staff members have learned something new after returning from an external training. (DOC)"*

Based on interviews with the Head of the Kombi Community Health Center, nurses' enthusiasm for attending seminars or training sessions can be categorized as relatively good, especially when the activities are relevant to their programs. The statement that the community health center management "arranges the schedule so that services are not empty" indicates structural support from the leadership for competency development. From an educational management perspective, organizational support is a key determinant of the success of continuing education. Mlambo et al. (2021) in BMC Nursing emphasized that nurse participation in continuing professional development (CPD) is strongly influenced by leadership support, flexible work schedules, and the relevance of the material to daily clinical practice. Therefore, the Head of the Kombi Community Health Center's policy of adjusting the service schedule reflects managerial practices conducive to learning.

The increased enthusiasm when training aligns with their programs indicates that nurses' motivation is contextual and pragmatic. This means nurses are more motivated to participate in training that has a direct impact on their job performance. This is consistent with adult learning theory and empirical findings that adult healthcare workers are more motivated when learning is problem-centered and relevant to practice needs (Filipe et al., 2014). In the context of primary care, such as community health centers (Puskesmas), program-based training, for example on maternal and child health (KIA), tuberculosis (TB), immunization, or infectious diseases, is considered highly useful, thus increasing participation.

Another important aspect is the practice of internal sharing or small discussions after staff participate in external training. This indicates the emergence of a community of practice at the community health center level. The literature confirms that internal knowledge sharing strengthens the transfer of learning and enhances the impact of training on service quality (Reeves et al., 2017). Without internal dissemination mechanisms, the benefits of training often remain with individual participants and do not translate into increased organizational capacity. With internal discussions, Kombi Community Health Center has implemented an organizational learning approach, albeit informally.

However, an analysis of educational management needs to consider the sustainability and systematization of this practice. Is internal sharing documented? Is there an evaluation of the training's impact on changes in nursing practice? In many studies, CPD without implementation monitoring has limited impact on clinical behavior change (Filipe et al., 2014). Therefore, while enthusiasm is positive, strengthening the evaluation system and integrating training outcomes into operational standards and quality audits is necessary. Compared with research findings, conditions at the Kombi Community Health Center (Puskesmas Kombi) show a fairly positive pattern in terms of leadership support. A study by Aiken et al. (2014) in The Lancet emphasized that a supportive work environment, including managerial support for professional development, correlates with service quality and patient safety. Although the study focused on hospitals, the principle of leadership support remains relevant in primary care. Globally, organizations that successfully develop a learning culture typically have formal CPD systems, clinical mentoring, and the integration of learning into performance evaluations.

The findings of this study indicate that the Kombi Community Health Center possesses social capital and leadership that support competency development. The next challenge is transforming individual enthusiasm into a structured, measurable, and sustainable learning system. Strategies that can be considered include establishing regular scientific forums, recording shared outcomes as part of quality documentation, and integrating CPD with nursing service performance indicators. Overall, the enthusiasm of nurses at the Kombi Community Health Center can be considered quite good and is supported by adaptive leadership. However, to achieve international standards in continuing nursing education, it is necessary to strengthen the aspects of systematization, impact evaluation, and institutionalization of learning so that training is not just an episodic activity, but becomes an integral part of the professional culture at the community health center level.

Analysis by the Head of the Tumaratas Community Health Center, Minahasa Regency

Based on interviews, it was learned that nurses are required to participate in scientific activities such as seminars, workshops, and training in Minahasa Regency. The following is a summary of the nurses' participation at the Tumaratas Community Health Center:

As nurses, they are required to participate in scientific activities such as seminars, workshops, and training in Minahasa Regency. The following is a summary of the nurses' participation at the Tumaratas Community Health Center?

> *"Nurses at our community health center are required to fulfill their SKP (Study of Competency) requirements, so they continue to participate, including those conducted online. Now, their groups have links for free registration or low-cost options. If they get a free one, they take it or attend the free seminar. The only requirement is that they have a valid SKP to participate. However, if it's conducted or organized by the district-level office, they adapt or follow it. (DOC)"*

This will certainly be adjusted to the district's requirements. If they attend training or workshops at the district level, what is the health center leadership's policy regarding who gets the opportunity? Is it always the same person, or does it rotate?

> *"According to the invitation, we usually go directly to the health program holder. So it's not the individual. With our large number of employees and evenly distributed programs, the invitation isn't always one or two people. For our limited number of employees, depending on the training included in the invitation letter, it goes directly to the designated program holder. Unless the person in question is on leave. Yesterday, there was a situation where it should have been a health promotion officer, but because there was only one health promotion officer, and the health promotion officer was on leave at the time, we assigned the person to a colleague close to the event. It's not always the same person, so it's more evenly distributed. (DOC)"*

Based on interviews, nurses at the Tumaratas Community Health Center (Puskesmas)'s participation in scientific activities such as seminars, workshops, and training demonstrated a regulatory and program-oriented participation pattern. Fulfilling the SKP (Standardized Competency Standards) was the primary motivation, prompting nurses to continue participating in activities, including online and free ones, to fulfill their professional administrative obligations. From an educational management perspective, this reflects a compliance-based model of continuing professional development, where participation is driven by regulatory demands and administrative needs, rather than solely by intrinsic motivation to develop competencies. This phenomenon aligns with the findings of Mlambo et al. (2021), who stated that regulatory obligations are often the initial driver of nurses' participation in CPD. However, without the support of intrinsic motivation and an organizational learning culture, its impact on clinical practice can be limited.

The policy of sending training participants directly to program managers demonstrates an approach based on the organization's functional needs. Training invitations are directed to the relevant program managers, ensuring specific and contextual competency transfer. From a managerial efficiency perspective, this strategy is rational because it ensures the relevance of the material to the task. A similar approach is widely implemented in primary healthcare systems across various countries, where

training focuses on role-specific competencies to support the achievement of health program indicators (Filipe et al., 2014). However, this approach has the potential to create competency segmentation and limit the distribution of capacity across nurses if not balanced with a systematic internal dissemination mechanism.

Interestingly, the head of the community health center stated that the delegation was not always the same person and could be reassigned if the program officer was unavailable. This demonstrates the principle of relatively equitable distribution of opportunities within the context of limited human resources. In the healthcare leadership literature, equitable distribution of access to competency development contributes to increased job satisfaction and organizational commitment (Aiken et al., 2014). Although this study was hospital-based, the principle of equitable access to CPD remains relevant in primary care.

The use of free online seminars also demonstrates adaptation to budget constraints. Globally, digital learning and online CPD are important strategies for expanding access to training, particularly in resource-limited areas. The WHO (2020) emphasizes that digital transformation in healthcare education opens up opportunities for equitable competency distribution, but its effectiveness depends on integrating learning with local practice and supervision. Without an impact evaluation mechanism, online activities risk becoming merely an accumulation of certificates and SKPs.

The findings of this study indicate that the continuing education system at Tumaratas Community Health Center has a clear administrative foundation, namely the SKP requirement and a program-based assignment policy. However, the next challenge is transforming compliance patterns into a reflective and quality-oriented organizational learning model. Managerial strategies that can be considered include: mandatory internal post-training sharing, documentation of training outcomes in follow-up plans, integration of CPD in performance evaluations, and development of cross-program communities of practice.

Compared with international practice, the system at Tumaratas remains at the administrative-functional stage. In many developed countries, CPD is not only based on credit hours but also on outcomes, such as changes in clinical behavior and improvements in service quality indicators (Filipe et al., 2014). Therefore, strengthening the monitoring and evaluation system for training impact is crucial so that continuing education does not stop at fulfilling SKPs but actually improves the quality of nursing care. Overall, nurse participation at Tumaratas Community Health Center can be categorized as administratively active and responsive to program invitations. However, to achieve international standards in continuing professional development, it is necessary to strengthen the learning culture, equalize access to competencies across programs, and integrate training outcomes into daily clinical practice through a systematic and sustainable educational management approach.

Analysis of a 58-year-old female senior nurse with a nursing degree. She has worked as a nurse for 34 years and is a civil servant with the rank of Supervisor 4B. She works at the Sonder Community Health Center, with a full accreditation status.

Based on the interview results, regarding the level of nurse participation in scientific activities such as seminars, workshops, and training in Minahasa Regency, the following information was obtained:

How is nurse participation in scientific activities such as seminars, workshops, and training in Minahasa Regency?

"The Health Office usually invites us to these seminars, or we attend them individually, both at the Minahasa and ministry levels. We always attend; recently, there was a presentation at Satu Sehat. These trainings and seminars are now part of our SKP (Serving Officer's License) for processing SIPs, STRs, and promotions. (PW)"

Is there any awareness from the nurses themselves to follow this?

"There is indeed a personal awareness to participate. We always participate through Satu Sehat or BPKP. (PW)"

Based on interviews, the participation of senior nurses at the Sonder Community Health Center in scientific activities such as seminars, workshops, and training demonstrates professional characteristics that have been institutionalized within regulatory frameworks and career development. As a 58-year-old female nurse with a nursing degree and 34 years of experience and the rank of Supervisor IV/b, the respondent indicated that participation in scientific activities is driven not only by administrative demands such as fulfilling Professional Credit Units (SKP) for STR (Serving Certificate) and SIP (School License) extensions, and promotions, but also by personal awareness as part of her professional identity. The statement that seminars and training are now part of the One Healthy system and integrated with competency development mechanisms demonstrates the alignment between national regulations, the governance of fully accredited health facilities, and individual motivation. From an educational management perspective, this reflects a combination of compliance-based professional development and self-directed lifelong learning approaches, both of which are relevant in designing continuing nursing education at the regional level.

Theoretically, nurses' active involvement in continuing professional development (CPD) is a crucial determinant in maintaining clinical competence, adapting to changes in the health system, and improving the quality of primary care. Research by Brekelmans et al. (2015) shows that participation in CPD is influenced by the interaction between intrinsic motivation, organizational support, and professional regulatory demands. Senior nurses with longer experience tend to have a stronger reflective orientation toward continuous learning. This finding aligns with respondents' assertion of a personal awareness of continuing to participate in scientific activities, even after reaching a mature career stage. Furthermore, research by Pool et al. (2016) confirms that supportive work environment factors, including an organizational culture that emphasizes learning, are significantly correlated with the continued development of nurse competencies. The full accreditation status of Sonder Community Health Center can be understood as a contextual factor that strengthens this culture.

Furthermore, the literature emphasizes that the integration of digital systems in CPD, such as online platforms and national health information systems, increases the accessibility and flexibility of learning for healthcare workers (Filipe et al., 2014). Respondents' involvement in activities through Satu Sehat (One Healthy) or BPKP (Healthy Career Development Program) demonstrates an adaptation to digital transformation in professional education, which is relevant to the technology-based lifelong learning paradigm. However, several studies also warn that if CPD is too dominated by administrative

motives or credit points, there is a risk of reducing the meaning of learning to a mere formality (Manley et al., 2011). In this context, respondents' recognition of personal awareness is an important indicator that continuing nursing education in Minahasa is not merely instrumental, but also internalized as a professional need.

From an educational management perspective, these findings indicate that the continuing nursing education model in Minahasa Regency, particularly at highly accredited community health centers (Puskesmas), has entered the phase of an institutionalized CPD system, where regulations, digital systems, accreditation, and individual motivation are mutually reinforcing. To develop a dissertation model, a managerial framework is needed that balances regulatory compliance-based policies, service quality improvement strategies, and strengthening the intrinsic motivation of nurses across generations. Thus, continuing nursing education becomes not merely an administrative obligation but a sustainable professional learning ecosystem that directly impacts the quality of primary health care.

Analysis results for a Skilled Nurse, Age: 27 years. Last education: Diploma 3. Works at the Sonder Community Health Center, with a full accreditation status.

Based on the interview results, regarding scientific activities such as seminars or workshops to fulfill the SKP, the following information was obtained:

What about scientific activities such as seminars or workshops to fulfill the SKP?

"There's already awareness. I myself now have 27 SKPs. I recently joined BTCLS, mental health, and pulmonary tuberculosis. (PW)"

Are the opportunities to participate in training distributed equally?

"Usually, it depends on the program holder. But if it's not specifically in the program, check the schedule to see who's available. For example, this year's PPI training is for one person, but next year it's someone else. (PW)"

What about independent training (paid)?

"Some do, some don't. Younger people, because they need the SKP, still participate in the free ones at LMS or Satu Sehat. Seniors usually only participate when there's an official from the Department because they don't know how to access Satu Sehat. (PW)"

Based on interviews, a 27-year-old skilled nurse with a Diploma 3 degree in Nursing who works at the fully accredited Sonder Community Health Center demonstrated a relatively high level of awareness of the importance of scientific activities for fulfilling Professional Credit Units (SKP). Possession of 27 SKPs and participation in training courses such as BTCLS, mental health, and pulmonary tuberculosis demonstrate a professional orientation that is adaptive to regulatory demands and the clinical needs of primary care. From an educational management perspective, this behavior reflects the early career professional socialization phase, where young nurses tend to be responsive to

formal incentive systems, including mandatory recertification and career development. Literature indicates that in the early career phase, motivation to participate in continuing professional development (CPD) is often influenced by credentialing needs and the improvement of specific clinical competencies (Pool et al., 2016). This finding is consistent with respondents' statements that actively utilize the LMS and Satu Sehat platform to access free training.

However, the distribution of training opportunities based on program holders suggests a structural approach to CPD management at the community health center level. The annual rotation policy, for example, for PPI training, demonstrates managerial efforts to maintain equitable access and the sustainability of organizational competencies. Theoretically, this approach aligns with the concept of organizational learning, where individual capacity building is directed towards strengthening collective institutional capacity (Manley et al., 201). In the context of fully accredited facilities, this strategy is also relevant for maintaining service quality standards and external audit readiness.

An interesting aspect of this finding is the existence of a digital literacy gap between generations. Respondents stated that younger nurses were relatively active in accessing online training, while senior nurses tended to wait for activities facilitated by the Department due to limited access to digital platforms. This phenomenon aligns with research by Brekelmans et al. (2015), which emphasized that CPD participation is influenced by individual factors such as age, self-efficacy, and technological competence. Furthermore, a study by Filipe et al. (2014) showed that integrating digital systems into CPD increases accessibility, but its success is highly dependent on user readiness and institutional support. Within the framework of this dissertation on Continuing Nursing Education in Minahasa Regency, this situation indicates the need for an educational management design that not only provides access but also strengthens capacity building in digital literacy for nurses across generations.

Overall, the participation of young nurses in scientific activities to fulfill the SKP demonstrates a combination of regulatory motivation and the need to develop clinical competencies. From an educational management perspective, the CPD model at Sonder Community Health Center has a sound systemic foundation, particularly in terms of equal opportunities and utilization of online platforms. However, to achieve long-term sustainability, the development strategy needs to integrate a cross-generational mentoring approach, strengthen the organizational learning culture, and monitor the impact of training on health care outcomes. Thus, continuing nursing education will not only fulfill administrative requirements but will truly contribute to improving the quality of primary care in Minahasa Regency.

Analysis by the Head of the Wolaang Community Health Center, Minahasa.

Based on interviews, information was obtained regarding nurses at the Wolaang Community Health Center and their participation in scientific activities such as seminars, workshops, and training in Minahasa Regency, as follows:

For nurses at the Wolaang Community Health Center, how are nurses participating in scientific activities such as seminars, workshops, and training in Minahasa Regency?

"Indeed, seminars, workshops, and training are actively being conducted by the Health Office. They participate in seminars according to their programs. And it's usually very relevant, closely related to their nursing profession. Every year, there are updates, which are still being conducted

by the Health Office, both at the Regency and Provincial levels, upon invitation. So, they still participate when invited. They also participate independently in workshops conducted by nursing departments in Minahasa. (DOC)"

If we want to explore this together, over the past year, the learning process for issuing STRs and extending SIPs has been crucial. One of the key requirements for these extensions is the mandatory learning process. This learning process is implemented by the Ministry of Health through the Satu Sehat (Healthy One) application. According to the doctor, have the nurses at the Wolaang Community Health Center independently participated in seminars or workshops organized by the Ministry's Satu Sehat (Healthy One) application?

"Yes, because all nurses in Wolaang already have Satu Sehat accounts. So they can independently access the learning available on Satu Sehat. While the Ministry of Health's programs are generally free, there are also paid ones that they can choose based on their needs and those that are closely related to their work as nurses. So they can also access them independently through their Satu Sehat accounts. (DOC)"

Based on interviews with the Head of the Wolaang Community Health Center, nurses' participation in scientific activities such as seminars, workshops, and training programs demonstrates a structured, systemic pattern, integrated with national regulatory policies. Nurse participation is generally based on their respective programs, ensuring the relevance of the material to clinical practice is a primary consideration. In addition to official invitations from the District and Provincial Health Offices, nurses also participate in activities organized by nursing professional organizations (OPDs). From an educational management perspective, this pattern reflects a competency-based continuing professional development (CPD) approach, where capacity development is not conducted in a generic manner but tailored to the practice domain and primary care needs. This finding demonstrates alignment between organizational needs, external policies, and individual development.

Furthermore, the integration of the Satu Sehat platform as a learning tool for fulfilling STR and SIP renewal requirements demonstrates a digital-based transformation in professional education governance. All nurses have accounts and are able to independently access learning options, both free and paid, based on competency requirements. This demonstrates a relatively high level of digital literacy and independent learning. In international literature, online CPD systems are considered to increase the accessibility and flexibility of learning, particularly in the context of primary healthcare, which faces time and resource constraints (Filipe et al., 2014). Furthermore, Brekelmans et al. (2015) emphasized that effective CPD participation occurs when there is a combination of regulatory demands, organizational support, and individual intrinsic motivation. In the context of the Wolaang Community Health Center, these three factors appear to operate simultaneously.

From an organizational governance perspective, the policy of participating in training programs reflects a strategic alignment between human resource development and the needs of public health services. This approach is consistent with the findings of Pool et al. (2016), which showed that managerial support and the relevance of training materials to work practices are key determinants of CPD sustainability among nurses. Furthermore, the learning culture facilitated through STR and SIP

regulations reflects the institutionalization of lifelong learning within the healthcare system. However, as Manley et al. (2011) reminds us, the effectiveness of CPD is determined not only by the number of participants, but also by the extent to which the learning is internalized and implemented in daily clinical practice.

The findings of this study indicate that the Wolaang Community Health Center exhibits a relatively mature CPD management model, characterized by: regulation-based, digitally integrated, relevant to service programs, and supported by organizational access and individual motivation. Comparatively with international literature, this model aligns with global CPD best practices, particularly in terms of digital system integration and the alignment of competencies with primary care needs. The challenge going forward is no longer access, but rather evaluating the impact of learning on service quality and strengthening performance-based monitoring systems. Thus, continuing nursing education in Minahasa can move beyond mere administrative fulfillment to a strategic human capital development model in primary care.

Analysis by the Head of the Indonesian National Nurses Association (PPNI) in Minahasa Regency.

Based on interviews, the following information was obtained regarding the types of scientific activities a nurse should participate in:

> *"The most numerous and easily accessible scientific activities, whether conducted independently or through institutions, are non-formal, such as seminars or webinars, conducted online or offline, or through blended learning. Healthcare facilities can also offer in-house training facilitated by the facility, but formal education is also available through educational pathways for those with a Diploma (D3) degree to pursue a professional career. The profession is now also easily accessible: Masters in Nursing, even Doctoral degrees, and even Professorships are widely available to any nurse pursuing formal or non-formal education. (PPNI)"*

Looking at the reality on the ground, only a small percentage of nurses are enthusiastic about participating in scientific activities, and they're not even aware enough to participate independently. Most simply expect a call from the Health Department and assistance, even though these scientific activities are a requirement for reporting or obtaining permits. Even when promoted to a functional position, participation is mandatory, especially when it comes to permits. Is there a sense of awareness among all nurses to participate in these scientific activities?

> *"So, even though real data to measure nurse awareness doesn't exist yet, and we don't have the tools to measure it, the Indonesian Nurses Association (PPNI) itself has actually facilitated, issued warnings, and provided encouragement, even through a regulated application system. It's hoped that nurses will independently and consciously understand their obligations as members of the profession. This is because it's both to maintain and improve their competence, as service that prioritizes quality and patient safety is prioritized. Therefore, it's hoped that nurses will independently equip themselves through activities like those I mentioned earlier, whether seminars or webinars. From there, we can gain knowledge and obtain evidence-based healthcare services, in this case, nursing, that are up-to-date and in line with current conditions. Why? Because regulations*

ultimately drive massive change, but also because of current digitalization, so nurses inevitably have to update. This is not only for the purpose of managing STR permits, which are lifelong, but also for practicing permits. Why is this done in order to encourage our colleagues independently? So, this established system will inevitably affect those who practice nursing in every healthcare facility, and of course, those who are already working in this field. But it's not enough. Although the system is in place, in this case, the Indonesian Nurses Association (PPNI) wants to ensure that even when there's no awareness among its members, the system regulates it. So, whether they like it or not, this regulated system is necessary. So, to raise awareness among its members, in addition to appeals and encouragement, a regulated system is in place. However, we can't guarantee that all nurses are aware that improving their knowledge improves their competency; we don't have the data for that yet. But the PPNI has made that effort. Others might expect to receive facilities, whether in-house training, or funding from the Community Health Center (Puskesmas) or hospital to participate in training. To maintain and ensure that nurses' services remain high-quality and patient-safety oriented, efforts have been made to raise awareness, starting with the system that has been established. (PPNI)"

According to the Head of the Indonesian Nurses Association (PPNI) in Minahasa Regency, the scientific activities that nurses should participate in encompass a broad spectrum, from non-formal to formal education. Non-formal activities such as seminars, webinars, online training, blended learning, and in-house training facilitated by healthcare facilities are the most accessible and relevant forms of learning to meet the needs of daily clinical practice. Meanwhile, formal education through professional, master's, and doctoral levels of nursing is seen as a strategic pathway for strengthening scientific capacity and long-term professionalism. Therefore, continuing nursing education is understood not merely as fulfilling administrative obligations such as a Certificate of Completion (SKP) or practice permit, but as a lifelong learning process that supports quality care and patient safety.

However, the reality on the ground shows that nurses' participation in scientific activities is still dominated by a reactive approach, namely participating in activities facilitated by institutions or invited by the Health Office, rather than based on independent initiative. The Head of PPNI emphasized that the intrinsic awareness to voluntarily participate in scientific activities remains unequal among nurses. This indicates a gap between professional demands that require continuous learning and individual motivation to access cutting-edge knowledge. To bridge this gap, the Indonesian Nurses Association (PPNI) has developed a systemic approach through regulations, digital platforms, and competency development mechanisms that structurally encourage nurses to continuously update their knowledge based on evidence-based practice. In other words, efforts to increase participation in scientific activities depend not only on individual awareness but also on a system design that both compels and facilitates continuous learning.

This finding aligns with international research showing that the success of Continuing Professional Development (CPD) programs is determined not only by program availability but also by intrinsic motivation and organizational system support. Research by Pool et al. (2016) indicates that nurse participation in CPD is often influenced by a combination of regulatory incentives and perceived direct benefits to clinical practice. Meanwhile, research by Li et al. (2019) confirms that digital learning systems and technology-based platforms play a critical role in increasing nurses' accessibility and

engagement in scientific activities. This is relevant to PPNI's efforts to encourage the use of digital-based learning systems to increase independent participation. Furthermore, a study by Iacobucci et al. (2021) highlights that effective continuous learning requires an integration of professional regulations, institutional support, and a learning culture within healthcare organizations. In the Minahasa context, the PPNI's approach, through outreach, digital systems, and regulatory strengthening, demonstrates an effort toward a systems-based CPD model. However, the lack of a comprehensive measurement tool to assess nurses' awareness poses a challenge in ensuring the strategy's effectiveness.

These findings indicate that strengthening continuing nursing education is not sufficient simply through providing scientific activity programs but must be integrated with managerial strategies that build systems-based professional awareness. Thus, scientific activities are no longer perceived as an administrative obligation but rather as an integral part of professional practice oriented toward quality service and patient safety.

CONCLUSION

The conclusion of this study indicates that nurse participation in scientific activities such as seminars, workshops, and training is a strategic factor that plays a key role in realizing sustainable nursing education in Minahasa Regency. Involvement in scientific activities not only serves as a means of improving individual competency but also reflects the functioning of the educational management system within healthcare institutions. This finding confirms that the sustainability of nursing education is not solely determined by the availability of professional development programs, but rather by the extent to which the organization is able to create structural support, policies, and a learning culture that encourages the active participation of nursing staff in scientific activities. This aligns with global research that states that continuing professional development contributes significantly to improving the quality of clinical practice, patient safety, and professionalism. Furthermore, organizational support and educational leadership have been shown to be important determinants in increasing nurse engagement in professional learning activities. Therefore, participation in scientific activities should be viewed as part of a sustainable nursing education management strategy, not simply an individual responsibility. In the Minahasa context, this finding reinforces the importance of integrating institutional policies, managerial support, and access to scientific activities as a foundation for sustainable nurse capacity building. This approach is in line with recent studies showing that organizational support systems have a crucial role in ensuring the successful implementation of CPD as a mechanism for improving the quality of health services.

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