



The Efficacy of Evidence-Based Practice Training in Enhancing Decision-Making Competency Utilizing Fishbone Diagrams Among Nurse Managers at Hospital B Bandung

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ABSTRACT

The nurse manager is crucial in overseeing and directing nursing services to accomplish organizational objectives effectively. Nurse managers must possess the skill of evidence-based decision-making. This research aims to determine the efficacy of evidence-based practice training in enhancing decision-making skills among nurse managers at Hospital B Bandung, specifically through utilizing the Fishbone Diagram. This study employs quantitative research methodologies utilizing a pre-experimental design, specifically a one-group pre-post design. The research sample comprised 62 nurse managers, including 28 section heads, deputy section heads, coordinators, and 34 CCMs. These individuals received evidence-based practice decision-making training interventions involving fishbone diagrams and post-training intervention. The data analysis method employs the Wilcoxon bivariate test and the multivariate ordinal logistic regression test. The intervention yielded statistically significant improvements in decision-making practices, knowledge, attitudes, and skills. The p-value for these changes was 0.000 ($p < 0.05$), indicating a high confidence level in the results. This study suggests that providing evidence-based practice training to hospital nurse managers is necessary to enhance their decision-making skills. This can be achieved by utilizing fishbone diagrams or other similar tools.

Keywords: Fishbone Diagram, Competency, Evidence-Based Practice, Training, Nurse Manager, Decision-Making.

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INTRODUCTION

Nursing services are a type of professional service essential to the entire healthcare provision. The provision of nursing services is a crucial factor in attaining the objectives of a hospital. The topic pertains to nurses' leadership in nursing services and global needs. It emphasizes the need for professional management to effectively address and adapt to any changes that may arise (Umalihayati et al., 2023). The nurse manager oversees and directs nursing services to meet the company's goals effectively. Nurse managers are nurses responsible for coordinating all aspects of nursing care, whether on an individual, family, or community level. The management functions encompass planning, organizing, staffing, leading, and supervising a workforce (Marquis & Huston, 2015). Nurse managers must possess the competency of decision-making. Decision-making is choosing options or courses of action based on specific criteria (Big Dictionary of Science).

(Jankelová et al., 2021) Defines decision-making as a systematic process that involves analyzing a situation, collecting factual information, carefully evaluating available choices, and taking action based on calculated assessments to determine the most suitable course of action. Proficient leadership skills are necessary for prompt decision-making, considering immediate and long-term consequences. Nurse managers' participation in decision-making profoundly influences nurses' attitudes and beliefs, as they provide guidance and inspiration to help them achieve organizational and professional

objectives. This involvement is crucial for delivering effective and efficient healthcare and facilitating future professional growth and advancement, as required (Pishgooie et al., 2019); the Republic of Indonesia Law No. 28 of 2014 concerning Copyright, n.d.).

Evidence-based management (EBMgt) uses high-quality Evidence from diverse sources to inform decision-making, which managers now consider essential. Within this context, evidence-based management has been suggested to promote a stronger dependence on data when making decisions (Briner et al., 2009). When employing the EBMgt methodology, managers must ascertain, gather, or activate Evidence, cooperate with other stakeholders, and subsequently integrate it into their decision-making process (Moussata, 2017). Evidence-Based Practice (EBP) is a systematic approach that enables healthcare professionals to stay current and access the most recent information. This knowledge is a foundation for making effective and efficient clinical decisions, ultimately leading to optimal patient care (McNee, 2020). The successful execution of Evidence-Based Practice (EBP) relies on sufficient resources. The presence of sufficient human resources (HR) can facilitate the adoption of evidence-based practices (EBP), including factors such as educational qualifications, EBP-specific training, and other variables that can influence EBP implementation, such as organizational culture and organizational preparedness (Fonseca, 2023). Organizations must implement educational programs focused on evidence-based practice (EBP) to enhance knowledge, skills, attitudes, and self-confidence in utilizing research findings in nursing care (Hidayat et al., 2019).

EBP implementation is only universal across some hospitals. According to (Koota et al., 2021), a limited number of nurses possess the necessary skills to implement evidence-based practice (EBP) effectively. Research conducted by (Oktiayuliandri, 2015) indicates that the adoption of evidence-based practice (EBP) has been implemented at RSUP Dr. M. Djamil Padang since 2012. However, its effectiveness has yet to reach its full potential. The low implementation of evidence-based practice (EBP) can be attributed to several problems, including uniformity in nurse education, inadequate knowledge among nurses, resistance to engaging with academic journals and research, and limited understanding of research methodologies. According to a study conducted by (Saunders & Vehviläinen-Julkunen, 2016), the readiness of nurses to implement evidence-based practice (EBP) is influenced by factors such as their level of Education, knowledge of EBP, previous experience with EBP, age, and years of work experience. The study also suggests that providing training and guidance on EBP can enhance nurses' knowledge in this area. Another hindering issue is the absence of assistance from the nurse manager in adopting evidence-based practice in the room. Nurse managers are crucial in fostering evidence-based practice (EBP) and must possess both practice and leadership abilities. Nurse managers' surveys on adopting evidence-based practice (EBP) yielded inferior outcomes (Melnik et al., 2008). (Clarke et al., 2021) also conveyed a similar sentiment that adopting evidence-based practice (EBP) among nurses is still significantly limited, with many nurse managers opting for a passive approach towards its implementation (Wilkinson et al., 2011). The main obstacles to implementing evidence-based practice (EBP) in 2018 are insufficient resources, inadequate training in research methodologies, absence of mentoring, lack of support from hospital administration, lack of enthusiasm in implementing EBP findings, and limited time available to implement EBP in the work environment. Musdalifa Kendeng et al. (2022) identified multiple hurdles and impediments encountered by nurse managers throughout the implementation of evidence-based practice (EBP). The absence of assistance from management, insufficient resources and competencies in evidence-based practice (EBP), and the nurse manager's leadership approach.

A fishbone diagram, or an Ishikawa diagram or cause-effect analysis, is commonly employed in decision-making. It is a reactive risk management technique that involves identifying potential sources of a problem and determining its root cause through brainstorming sessions. Identifying the underlying

source of the problem is expected to facilitate the implementation of necessary measures and corrective actions. Nurse managers frequently use fishbone diagrams for problem analysis during decision-making (Sudjiati et al., 2021).

One strategy to address the limited adoption of evidence-based practices (EBP) is to provide training. Training is a deliberate endeavor aimed at enhancing and cultivating the attitudes, behavior, abilities, and knowledge of personnel in alignment with the objectives and preferences of an institution or organization. Training is a purposeful and systematic activity to acquire skills and information in a particular profession. It enhances work effectiveness and efficiency (Iswan, 2021). (Alatawi et al., 2020) asserts that training and Education are crucial in enhancing nurses' knowledge and skills in utilizing evidence-based procedures.

According to the observed phenomena, the facts indicate that nurse managers at Hospital B Bandung lack sufficient knowledge and skills in applying evidence-based practice (EBP) when making decisions using fishbone diagrams. Furthermore, specific training has yet to be conducted on this matter. Researchers are interested in thoroughly analyzing the impact of Evidence-Based Practice (EBP) training in enhancing decision-making competency among nurse managers at Hospital B Bandung, specifically through the use of fishbone diagrams, by conducting EBP training sessions for decision-making, utilizing fishbone diagrams, and evaluating the impact of the training on the knowledge and abilities of nurse managers. This reserach aims to analyze the factors that affect village financial management, both from internal and external factors. The benefits of this study are to provide a deeper understanding of effective and efficient village financial management, as well as provide recommendations for increasing the capacity of financial management at the village level.

METHOD

This study employs a quantitative research approach with a quasi-experimental design known as a one-group pretest-post-test design. This design involves conducting an initial test (pretest) before administering the treatment, followed by a final test (posttest) after the treatment has been given. This research method was conducted (Rustika, 2013) in which a single group was given a specific treatment and observed before and after the treatment. The study was conducted at RS B Bandung from June to August 2023. The research was conducted following the acquisition of approval from the Director of Hospital B and ethical clearance from the STIK Sint Carolus Research and Development Ethics Committee (No.079/KEPPKSTIKSC/VI/2023).

The sampling technique used is purposive sampling, where researchers select samples based on certain criteria that are considered relevant to the research objectives. The sample for this study comprised 62 nurse managers, including 28 section heads/deputy section heads/coordinators and 34 CCMs. The study included nurses who held positions as head of section, deputy head of section, Coordinator, and CCM/Clinical Care Manager at Hospital B Bandung and who got a decision letter before the research was conducted. The data gathering was conducted between June and August of 2023. Researchers adhered to research ethical norms during the study to uphold research ethics.

The data collection tool employs a questionnaire incorporating evidence-based practice in decision-making and decision-making abilities utilizing fishbone diagrams. The research employed the Evidence-Based Practice Questionnaire (EBPQ), first designed by (Upton Upton, 2006) and subsequently adapted into an Indonesian form by Fajarini, 2020). The researcher further changed the questionnaire to suit the specific requirements of the current study. This questionnaire includes a knowledge scale with ten statements, an attitude scale with four statements, and a practice/skills scale with ten statements. Additionally, there is a decision-making skills questionnaire with 16 statements, rated from 1 to 10, ranging from bad to very good. The statements in the decision-making skills

questionnaire have been adapted from existing literature to meet current research requirements. The questionnaire's validity was assessed in a hospital of the same category as the research site, specifically S-type Hospital B in Jakarta. A total of 30 respondents were selected based on the research criteria. After conducting tests to assess the validity of the questionnaire, it was determined to be both valid and reliable. Data analysis techniques used univariate analysis, bivariate analysis, and multivariate analysis.

RESULTS AND DISCUSSION

Univariate Analysis

Table 1. Characteristics of Respondents at Hospital B Bandung, Categorized By Sex, Age, Education, Length Of Work, Position, and Tenure

No	Variable	Category	Frequency	Percentage (%)
1	Sex	- Male	7	11.3
		- Female	55	88.7
2	Age	- 20 – 40 yo	31	50.0
		- >40 – 56 yo	31	50.0
3	Education	- Associate/Diploma	14	22.6
		- Bachelor	48	77.4
4	Length of Work	- ≤ 15 years	27	43.5
		- > 15 years	35	56.5
5	Position	- CCM/ PPB	34	54.8
		- Division Head/Deputy Division Head/Coordinator	28	45.2
6	Tenure	- ≤ 5 years	48	77.4
		- > 5 years	14	22.6
	Total		62	100

Source: 2023 Primary Research Data

Table 1 demonstrates that the research sample mainly consisted of female nurse managers, with 55 individuals (88.7%). In comparison, the remaining seven individuals (11.3%) were male. There are 31 nurse managers between the ages of 22-40 and 31 nurse managers over 40, making up 50.0% of the total. Out of the nurse managers, 77.4% possess an undergraduate educational level, which amounts to 48 individuals. The remaining nurse managers hold diploma degrees. More than half (56.5%) of nurse managers had a length of service above 15 years, whereas only 43.5% had shorter than 15 years. Of the total nurse managers, 34 individuals held the post of CCM, accounting for 54.8% of the group. The remaining 45.2% were Head of Division, Deputy Head of Division, or Coordinator. Most nurse managers (77.4%) had a length of office that was less than or equal to 5 years.

Table 2. Description of The Knowledge Related to Decision-Making based on Evidence Based Practice (X₁) in the Pretest and Posttest (n=62)

No	Variable	Pretest		Posttest	
		Frequency	%	Frequency	%
2.	Knowledge:				
	- Poor (score:10-40)	33	53.2	-	-
	- Moderate (score 41-71)	28	41.9	20	32.3
	- Good (score 72-100)	3	4.8	42	67.7
	Total	62	100	62	100

Source: 2023 Primary Research Data

Table 2 indicates that, out of the 62 nurse manager respondents, 33 individuals (53.2%) reported a deficiency in their understanding of utilizing evidence-based practice in decision-making, whereas 28 individuals (41.9%) considered their knowledge adequate. Three individuals (4.8%) saw it as excellent.

Of the 62 nurse manager respondents, 20 individuals (32.3%) reported having adequate knowledge of utilizing evidence-based practice in decision-making, whereas 42 individuals (67.7%) expressed proficiency in this area.

Table 3. Description of the Attitudes Towards Decision-Making Based on Evidence-Based Practice (X₁) in the Pretest and Posttest (n=62)

No	Variable	Pretest		Posttest	
		Frequency	%	Frequency	%
3.	Attitudes:				
-	Poor (score:4-16)	34	54.8	-	-
-	Moderate (score 17-29)	27	43.5	26	41.9
-	Good (score 30-40)	1	1.6	36	58.1
	Total	62	100	62	100

Source: 2023 Primary Research Data

Table 3 indicates that, out of the 62 nurse manager participants in the pretest, 34 individuals (54.8%) reported a deficiency in their inclination towards utilizing evidence-based practice in decision-making, whereas 27 individuals (43.5%) deemed it adequate. One person (1.6%) considered it to be satisfactory. Of the 62 nurse manager responses, 26 (41.9%) reported utilizing evidence-based practice in decision-making adequately, whereas 36 (58.1%) reported being good.

Table 4. Description of Decision-Making Skills Based on Evidence-Based Practice Using Fishbone Diagram (Y) in the Pretest Posttest (n=62)

No	Variable	Pretest		Posttest	
		Frequency	%	Frequency	%
4.	Decision-Making Skills				
-	Insufficient (score:16-64)	9	14.5	37	59.7
-	Satisfactory (score 65-113)	50	80.6	25	40.3
-	Excellent (score 114-160)	3	4.8		
	Total	62	100	62	100

Source: 2023 Primary Research Data

Table 4 indicates that out of the 62 nurse manager respondents in the pretest, nine individuals (14.5%) reported being inadequate in utilizing fishbone diagrams to implement evidence-based practice decision-making abilities, 50 individuals (80.6%) reported being proficient, and three individuals (4.8%) reported being very skilled. Of the 62 nurse management responses, 37 (59.7%) reported proficient decision-making abilities utilizing evidence-based practice using fishbone diagrams. In contrast, 25 individuals (40.3%) reported being highly skilled.

As per Indonesian Law No.36 of 2014, competency for health workers refers to their capacity to perform their duties effectively, which is determined by their knowledge, skills, and professional attitudes. Government rule No. 101 of 2000 states that civil servants must acquire the specific information and behavioral attitudes necessary for their roles and responsibilities. However, as per (Wibowo, 2016), competency refers to the capacity to effectively perform a job or task, utilizing the necessary skills, knowledge, and work attitudes demanded by the job.

Bivariate Analysis

Table 5. Wilcoxon Test Results for the Variable of Decision-Making Practices Based on Evidence-Based Practice (X₁) Before and After Intervention

Variable	N Negative Ranks	N Positive Ranks	N Ties Rank	Mean Positive Ranks	The sum of Positive Ranks	Sig P Value Wilcoxon
Decision-Making Practices Based on EBP (X ₁)	1	50	11	26.1	1309,50	0,000

Source: 2023 Primary Research Data

Table 5 demonstrates that the t-statistic yields a significant value of 0.000, less than 0.05. This indicates a significant change in decision-making using evidence-based practice after the intervention.

Table 6. Wilcoxon Test Results for the Variable of Decision-Making Knowledge Based on Evidence-Based Practice (X₁) Before and After Intervention

Variable	N Negative Ranks	N Positive Ranks	N Ties Rank	Mean Positive Ranks	The sum of Positive Ranks	Sig P Value Wilcoxon
Decision-Making Knowledge Based on EBP (X ₁)	0	52	10	26.50	1378.0	0,000

Source: 2023 Primary Research Data

Table 6 indicates that the t statistical results yielded a significant value of 0.000 < 0.05, indicating a substantial alteration in decision-making knowledge utilizing evidence-based practice following the intervention.

Table 7. Wilcoxon Test Results for the Variable of Decision-Making Attitudes based on Evidence-Based Practice (X₁) Before and After Intervention

Variable	N Negative Ranks	N Positive Ranks	N Ties Rank	Mean Positive Ranks	The sum of Positive Ranks	Sig P Value Wilcoxon
Decision-Making Attitudes based on EBP (X ₁)	0	44	18	22.50	990.0	0,000

Source: 2023 Primary Research Data

Table 7 displays the findings of t statistics, which yielded a significant value of 0.000 < 0.05. This indicates a noteworthy alteration in decision-making attitudes towards evidence-based practice following the intervention.

Table 8. Wilcoxon Test Results for the Variable of Decision-Making Skills using Fishbone Diagram (Y) Based on Evidence-Based Practice Before and After Intervention

Variable	N Negative Ranks	N Positive Ranks	N Ties Rank	Mean Positive Ranks	The sum of Positive Ranks	Sig P Value Wilcoxon
Decision-Making Skills Based using Fishbone Diagram (Y) on EBP	2	28	32	15.68	439.0	0,000

Source: 2023 Primary Research Data

Table 8 indicates that the t statistical results yielded a significant value of 0.000 < 0.05, indicating a noteworthy alteration in decision-making abilities influenced by evidence-based practice employing fishbone diagrams following the intervention. Therefore, offering training in evidence-based practice has been demonstrated to effectively enhance decision-making abilities rooted in evidence-based practice, utilizing the fishbone diagram. Most participants performed well, while a small fraction excelled on the pretest. Following the administration of the intervention, the majority of the categories remained at a satisfactory level, with a notable rise observed in the excellent category. The findings of this study are corroborated by the research conducted by (Alatawi et al., 2020), which asserts that training and Education play a crucial role in enhancing knowledge and skills through evidence-based techniques.

Multivariate Analysis**Fit Model Feasibility Test****Table 9. Fit Model Feasibility Test of Decision-Making Competency using Fishbone Diagram based on Evidence-Based Practice**

	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	64.098			
Final	50.869	13.229	9	.153

Source: 2023 Primary Research Data

Table 9 displays the suitability of the model's fit on the dependent variable of decision-making competence using fishbone diagrams grounded in evidence-based practice. After the training intervention on applying evidence-based practice in decision-making using fishbone diagrams, there was a decrease of -2 log probability from 64,098 to 50,869. Based on statistical analysis, it can be inferred that the model incorporating the independent variable of Evidence-Based Practice Training in Decision Making Using Fishbone Diagrams yields higher accuracy in predicting improved decision-making competence among nurse managers, as indicated by a p-value greater than 0.005.

Overall Model Test**Table 10. Overall Model Test of Decision-Making Competency Using Fishbone Diagram Based on Evidence-Based Practice**

	Chi-Square	df	Sig.
Pearson	32.736	30	.334
Deviance	37.654	30	.159

Source: 2023 Primary Research Data

Table 10 displays the level of agreement between the dependent variable of decision-making competence and a fishbone diagram grounded in evidence-based practice. The Chi-Square value was greater than 0.05, indicating that the probability value for the intervention was statistically significant. The evidence-based practice training intervention utilizes a research model that uses a fishbone diagram to predict decision-making competence based on evidence-based practice. This prediction uses a significance level (p-value) greater than 0.05.

Pseudo R-Square Test**Table 11. Pseudo R-Square Test on the Intervention Group of Evidence-Based Practice Training for Decision-Making Competence Using Fishbone Diagram**

Cox and Snell	.192
Nagelkerke	.260
McFadden	.158

Source: 2023 Primary Research Data

The results of testing the impact of enhancing decision-making competence using a fishbone diagram grounded on evidence-based practice are presented in Table 11. The Pseudo R-squared value, precisely the Cox and Snell value, is 0.192. This indicates that 19.2% of the variation in the independent variable (Evidence-Based Practice Training) can be explained by the dependent variable (Increasing Decision-Making Competency Using Fishbone Diagrams). The remaining 80.8% is attributed to other variables not included in the model. According to the researcher's assumptions, the Cox and Snell determination test yielded findings of 19.2%, indicating that the independent variable can only have a 19.2% impact on the dependent variable. In order to enhance the value of research, it is imperative to incorporate additional variables that can potentially impact the improvement of decision-making skills among nurse managers. These variables may include participant motivation, organizational support, predisposition to change, time and active participation, utilization of training materials, availability of

additional resources, and team involvement. Based on evidence-based practice, the fishbone diagram can be utilized for this purpose (Tazebew et al., 2023). Management support, support structures, organizational and professional ideals, and disparities in health policies and hospital settings all impact decision-making skills. The study revealed that nurse managers who got management help demonstrated significantly higher decision-making participation levels than those who did not receive such support.

Parameter Estimate Test

Table 12. Parameter Estimate Test for Independent Variables on Decision-Making Competence Using Fishbone Diagram in Evidence-Based Practice Training Intervention

Parameter Estimates							95% Confidence Interval	
	Estimate	Std. Error	Wald	df	Sig.		Lower Bound	Upper Bound
Threshold	Decision-Making Fish bone Post = 2]	-1.035	.840	1.518	1	.218	-2.681	.612
Location	[Sex=1]	.443	.997	.197	1	.657	-1.511	2.397
	[Sex=2]	0	-	-	0		.	
	[Age=1]	1.300	1.378	.890	1	.345	-1.401	4.000
	[Age=2]	0			0		.	
	[Education =]	-475	.798	354	1	.552	-2.038	1.089
	[Education=2]	0	.	.	0		.	
	[Length of Work=1]	-1.844	1.427	1.671	1	.196	-4.641	.952
	[Length of Work=2]	0			0			
	[Position=1]	-276	.719	.147	1	.702	-1.685	1.134
	[Position=2]	0			0			
	[Tenure=1]	-215	.770	.078	1	.780	-1.723	1.293
	[Tenure=2]	0			0		.	
	[Practice Post=2]	-.859	.906	.900	1	.343	-2.634	.916
	[Practice Post=3]	0			0			
	[Knowledge Post=2]	-496	.998	.247	1	.619	-2.452	1.460
	[Knowledge Post=3]	0			0		.	
	[Attitude Post=2]	-1.112	.658	2,852	1	.091	-2,402	.179
	[Attitude=3]	0	-	-	0			

Link function: Logit

a. This parameter is set to zero because it is redundant

Source: 2023 Primary Research Data

Table 12 illustrates the impact of the independent variable on the dependent variable. The p-value obtained for the variables gender, age, education level, length of employment, respondent's position, and length of service is more significant than 0.005. Based on statistical analysis, it was determined that no factor had a substantial impact on changes in decision-making competence, as indicated by the fishbone diagram. The research findings of (Tazebew et al., 2023) indicate no correlation between the sociodemographic features of participants, such as job experience, education level, and age, and the level of involvement of nurse managers in decision-making. This disparity may be attributed to variations in health policies, diverse nurse manager activities, and professional ideals.

Parallel Lines Test**Table 13. Parallel Lines Test of Evidence-Based Practice Training Intervention on Increasing Decision-Making Competence Using Fishbone Diagram**

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Null Hypothesis	50.869			
General	50.869	.000	0	

Source: 2023 Primary Research Data

Table 13 displays the outcomes of the Parallel Lines test for enhancing decision-making proficiency using Fishbone Diagrams, with a value of -2 Log. Given that the likelihood of obtaining the same value, precisely 50,869, is observed, it can be concluded that the model is deemed suitable. The results indicate that training in evidence-based practice positively impacts decision-making ability, specifically when employing fishbone diagrams.

CONCLUSION

Based on the results and discussions, this study identifies various factors that affect village financial management, which are divided into internal and external factors. Internal factors include the quality of human resources, especially village officials and their knowledge of financial management or accounting, which significantly affects the effectiveness of village financial management. Transparency and accountability in village financial management also play an important role. In addition, the level of community participation and involvement in the village financial management process is another critical factor. External factors that affect village financial management include regulations and policies from the central and regional governments, which greatly determine how village finances are managed. The economic and social conditions of the village community also have a significant impact on village financial management. In addition, the availability of technology and infrastructure affects the ability of villages to manage finances effectively.

Based on the findings of this study, it is recommended that the village government pay attention to several things, namely improving the quality of human resources through training and continuous education for village officials to improve competence in financial management and accounting. Strengthening transparency and accountability can be done by implementing systems and mechanisms that increase transparency and accountability in village financial management, such as the use of information technology and village financial information systems (SISKEUDES). The implication of this study is the importance of synergy between the village government, the community, and the central or regional government in creating efficient, transparent, and accountable village financial management. With comprehensive support, it is hoped that village financial management can be more optimal, so that it can support sustainable village development and improve the welfare of the village community as a whole.

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