NurseMedia
JOURNAL OF NURSING

ORIGINAL RESEARCH

Measures of Nursing Environment Multidimensionality and Patient Centricity Using Importance-Performance Map Analysis

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Article Info	Abstract
  Corresponding Author: Andy Andy Department of Hospital Administration, Graduate School of Management, Universitas Pelita Harapan, Jakarta, Indonesia Email: andybai78@gmail.com	**Background:** The nursing environment has become a consideration for an organization in improving service quality, especially in the implementation of patient-centred care. The various dimensions make it necessary to know which sectors need to be prioritized. However, there is still limited research that is more specific in linking the dimensions to become more operational. **Purpose:** This study aimed to analyze the relationship between nursing environment dimensions and patient centricity through the Importance-Performance Map Analysis (IPMA). **Methods:** A quantitative survey with a cross-sectional approach was conducted in June 2022 to test the conceptual framework on the population obtained from non-managerial inpatient nurses who worked for above two years in a general hospital in East Java, Indonesia. The constructs were measured using a set of indicators in The Practice Environment Scale of the Nursing Work Index (PES-NWI) and Patient Centricity. During the data collection, a total sampling technique was performed, resulting in 89 respondents being acquired. The data were analyzed through partial least squared structural equation modelling (PLS-SEM). **Results:** At the construct level, the mean total effect and performance were 0.192 and 56.302, respectively. From the IPMA chart, it was found that the construct in the right lower quadrant with the largest total effect value but not having adequate performance was nursing manager ability (total effect: 0.294, performance: 34.563), making it a construct with the highest importance and requiring priority for improvement among all dimensions. **Conclusion:** The nursing environment dimensions have to get attention to achieve patient centricity in inpatient ward nurses, where nursing manager ability is the dimension that has the most vulnerable performance. Leadership development is needed for the head nurse of the inpatient unit to strengthen the ability to lead and change the culture in nurturing subordinates so that kinship between nursing professionals can be established.

1. Introduction

Demands for improved healthcare are created by technological advancements. All nurses, regardless of academic background, job, or clinical specialty, are affected by these advancements throughout the whole spectrum of healthcare, therefore the services offered must likewise promote greater patient growth. A workforce that is ready to embrace healthcare must be able to enlighten, educate, and empower people, address ongoing and emerging ethical concerns, and foresee any negative effects on vulnerable groups. By incorporating scientific results into moral healthcare practices that benefit both patients and society, nurses play a crucial role in driving change to improve health. However, there is strong evidence that many nurses throughout the world lack competence and confidence, and education is inconsistently provided. They claim this is connected to the working and educational environments over which they control (Mahendradhata et al., 2017; Yeoman et al., 2017).

In Indonesia, many internal and external issues are still spread regarding the problems of nurses' welfare. It can be said that nurses have provided the best nursing care and carried out all their duties and responsibilities professionally, but the efforts of nurses are sometimes still under-appreciated and also still not seen by the community (Senek et al., 2020), even though everything

nurses do is very influential on the development of a patient's health. A nurse's main goal is to improve the welfare of patients, how they apply what they know, and what they get in lectures about humanizing humans (humanism). However, in reality, it is necessary to know that nursing is one of the professions in Indonesia with the lowest reward, which is very unfortunate (Mahendradhata et al., 2017; Suhadi & Siyoto, 2020).

The welfare of healthcare workers, which is certainly diverse in Indonesia, will certainly affect the way they interact with patients, coupled with pressure in the world of work that requires them to carry out obligations related to humanity to their patients to implement patient centricity (Andy & Antonio, 2022). Various problems regarding patient centricity indicators relate to the perception and performance of nurses. A study shows that there are cases of adverse drug events with an incidence rate of 50.1 per 1,000 persons annually in a hospital in Indonesia, which are dominated by administration errors (46.91%), followed by dispensing errors (38.76%) and prescription errors (14.33%) (Hartati et al., 2014). Furthermore, there is evidence that medical waste in Indonesia is not properly managed. A study in Central Java showed that there was 37.3% unfavorable behavior of disposing medical waste caused by nurses' attitude who only prioritized avoiding patient complaints without the need to think about hospital quality control (Jennifa et al., 2021). Another study in Aceh Tamiang showed that more than 50% of nurses lacked the behavior of disposing of medical and non-medical waste (Muchsin & Syahrial, 2013). An increase in safety incidents of 0.3% in a hospital in Surabaya is also an important consideration, as a lack of safety culture can result in outcomes including longer length of stay, higher 30-readmission rates, and increased postoperative mortality rate (Adriansyah et al., 2021). This shows the need for correction of behavior in order to provide an outcome in the form of a nurse's behavior orientation that puts the interests of the patient rather than a pragmatic attitude in healthcare.

As nurses have direct patient contact, good collaboration is necessary among healthcare providers. Among the many healthcare professionals whose actions can significantly affect patient outcomes are nurses. They interact with patients and their caregivers the bulk of the time. Therefore, healthy nurse-patient and caregiver interactions are therapeutic and an essential part of treatment. In addition to their core care responsibilities, nurses frequently serve as translators or patients' advocates. Even though good nurse-patient relationships have a favorable effect on nurse-patient communication and engagement (Molina-mula & Gallo-estrada, 2020), research has revealed that several factors have a negative impact on these relationships, with major repercussions for care outcomes and quality.

Research conducted by Lamberti and Awatin (2017) found that creating patient centricity by healthcare workers, in this case, dominated by nurses, can be predicted by buy-in by senior management, organizational vision, and resources. However, in the study conducted by Nartey et al. (2020), Yu et al. (2019), and Zhao et al. (2008), it was found that patient centricity can be determined by involving, empowering, and training all supply chain actors with measurements based on technical, interpersonal, social, and moral dimensions. Due to the different perspectives found in various studies, the authors try to summarize all of these things as a nursing environment as a predictor to explore the evidence that has been presented. In addition to the above, limitations were found in a previous study by Kieft et al. (2014) that uses a unidimensional approach to the nursing environment in measuring outcomes. This was reviewed by research conducted by Arsat et al. (2022) and they propose that multidimensional measurements can be carried out in applying the nursing environment as a predictor and find out which dimensions have a dominant role. Finally, patient centricity is a variable that seems new in health service management, especially from the perspective of a healthcare provider. Therefore, a study is needed to explore this to evaluate employee motivation and performance to optimize the quality of patient-centred care that supports patient safety and quality control. Accordingly, due to the scarcity of empirically based research studying the phenomenon of multidimensionality of the nursing environment that embraces diverse sectors in hospitals in Indonesia, this study aimed to analyze the relationship between the dimensions of nursing environment and patient centricity, analyzing through the IPMA to know what aspects to improve according to their performances.

2. Methods
2.1 Research design
This study used a quantitative survey approach with a cross-sectional design to answer the research issues (Bougie & Sekaran, 2020). The objects in this study are all variables included in

this research model. The dependent variable is patient centricity, while nursing environment dimensions including nurses' participation in hospital affairs, nursing foundation for quality of care, nursing manager ability, staffing and resource adequacy, and collegial nurse-physician relationship are the independent variables. The description above is illustrated as the conceptual framework shown in Figure 1.
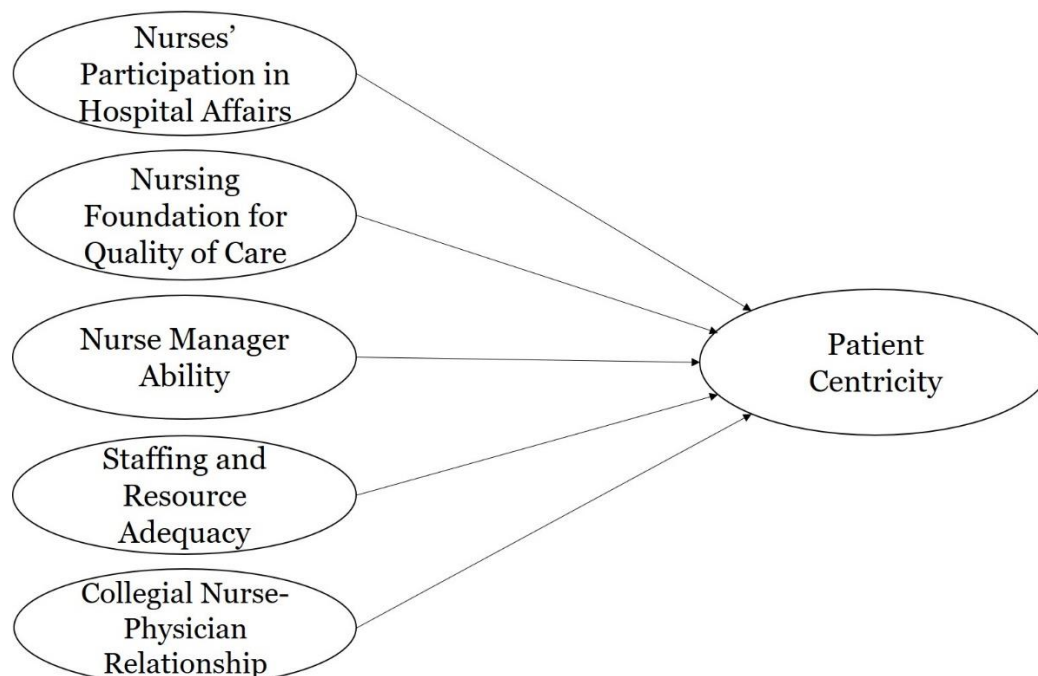
Figure 1. Conceptual framework

2.2 Setting and samples

This study employed total sampling on the population obtained from non-managerial inpatient nurses who work for above two years in a general hospital in East Java, Indonesia. The inclusion criteria for this study were nurses with permanent employee status, physically and mentally healthy, and willing to participate in the research. Respondents were excluded from the study if they were undergoing further education, on leave, or in the process of resigning. Sampling was carried out in June 2022. G*Power (version 3.1.9.7) was used to estimate the required sample size (Memon et al., 2020) based on a significance level of 0.05, an effect size of 0.35, and a power of 0.95. Accordingly, the calculated required minimum sample size for this study was 63. The number of nurses who met the population criteria above was 89 people. Questionnaires were distributed online to all of the respondents referred to above with a response rate of 100%.

2.3 Measurement and data collection

An online questionnaire was utilized for data collection in this study. Each questionnaire involved four sections. The researchers developed the first section as filter questions which ensure that participants are research subjects who have met the desired population criteria. The second section involves several items related to the demographic information of the participants. These demographic data included age, gender, marital status, last formal education, length of work, work duration (per week), department, and whether they have previous work experience in other hospitals. The third section was the questionnaire for the dimensions of nursing environment adopted from the updated review of The Practice Environment Scale of the Nursing Work Index (PES-NWI) (Swiger et al., 2017) to elicit data about the nursing environment. The part consists of five groups of statements which were "Nurses' Participation in Hospital Affairs" (9 indicators), "Nursing Foundation for Quality of Care" (10 indicators), "Nursing Manager Ability" (5 indicators), "Staffing and Resource Adequacy" (4 indicators), and "Collegial Nurse-Physician Relationship" (3 indicators). Each participant was asked to rate each statement based on a 5-point Likert scale as follows: strongly disagree (1), disagree (2), neutral (3), agree (4), and strongly agree

(5). Regarding the fourth section of the questionnaire, the researchers adopted the Patient Centricity questionnaire designed by Srivastava and Singh (2020). This tool involved six indicators. The participants were asked to rate each statement based on a 5-point Likert scale as follows: strongly disagree (1), disagree (2), neutral (3), agree (4), and strongly agree (5). The reliability of this instrument has been established by its original authors and showed high reliability (α=0.814, *p*<0.001).

The researchers followed the guidelines of the World Health Organization for adopting and translating research tools (World Health Organization, 2022). Firstly, one of the nurses who have good English in collaboration with the lecturers from the Human Resource Management Division translated the original instrument into Indonesian. Then, a bilingual academician who has extensive expertise in scientific research checked the translated instrument for adequacy, conceptual correspondence, and any missing concepts or expressions. After that, an expert in English back-translated the Indonesian version of PES-NWI and Patient Centricity research instruments to English, and no major discrepancies were revealed between both versions.

In this study, the suitability and psychometric properties of the Indonesian version of PES-NWI and Patient Centricity research instruments have been examined by a panel of five experts, which satisfies the minimum required to fulfill the face validity (DeVellis, 2012), consisting of two healthcare management experts, two human resource management practitioners, and one field researcher. In this stage, there are several recommendations from experts to improve the structure of the questions to make them more understandable. After making improvements and resubmitting, seven items from 37 items were removed because they did not receive the above 80% agreement from the panel, and 30 items were still numerous enough for the next studies.

After obtaining the approval of the research ethics committees of Universitas Pelita Harapan and the targeted hospital, the researchers approached the potential nurse participants and explained the nature, purpose, and benefits of the study. Then each participant was given the link to the online questionnaire, and he/she was asked to fill in all items and submit it to the primary researcher after completing the questionnaire.

2.4 Data analysis

The PLS-SEM approach was used because it could examine complicated models in explanatory research. The conceptual framework has six components and is thought to be a complex research model. When the focus of the investigation is mainly on the model's explanatory and predictive power, PLS-SEM techniques are recommended (Hair et al., 2019; Shmueli et al., 2019). Measurement and structural models serve as the foundation for the primary PLS-SEM method. The measurement model is used to assess the validity and reliability of relationships between indicators and the corresponding model components. The structural model is used to investigate if there is a meaningful connection between each component in the study model. In this work, the authors combine descriptive analysis with inferential analysis using Importance-Performance Map Analysis (IPMA). The position of variables and indicators based on the mean (descriptive analysis) and total impact (inferential analysis) are shown in the figure (Sarstedt et al., 2017) as a two-axis mapping that combines the two analyses. IPMA can offer a useful summary of what may be improved (Sarstedt et al., 2022).

2.5 Ethical considerations

The study protocol was approved by the Institutional Review Board (IRB), Faculty of Economics and Business, Universitas Pelita Harapan, Tangerang, Indonesia (Code number: 114/EC-FEB/V/2022). The authors also requested approval from a general hospital in East Java. An informed consent form was made available as another measure to guarantee that this research did not go against ethical standards. The nurses who took part in the study signed informed consent forms that included information about the goals, methods, and participants' rights. The secrecy of responder data is one aspect of this. Before gathering the data, hospital administration approval was initially sought. The nurses were given the assurance that taking part would not have any bearing on their performance reviews.

3. Results
### 3.1 Respondents' characteristics

During the data collection, the number of 89 eligible samples filled out the online structured questionnaires. The demographic profile is described in Table 1. According to the data, 69.7% of respondents are in the age range of 30-49 years, so it can be inferred that the respondents are already emotionally mature. The majority of participants have a nurse profession educational background. With these circumstances, it is assumed that respondents are capable of understanding the questionnaire's questions.

Table 1. Respondents' profiles

Demographic Variables	Frequency (f)	Percentage (%)
Gender		
Male	36	40.4
Female	53	59.6
Age		
20 – 29 years	18	20.2
30 – 39 years	34	38.2
40 – 49 years	28	31.5
50 – 59 years	9	10.1
≥ 60 years	0	0
Marital status		
Not married yet	24	27.0
Married	17	19.1
Married with 1 child	15	16.9
Married with >1 child	28	31.5
Others	5	5.5
Last formal education		
Diploma	13	14.6
S1	28	31.5
Profession	48	53.9
Length of work		
3 – 5 years	44	49.4
6 – 10 years	27	30.3
> 10 years	18	20.3
Work duration (per week)		
35 – 42 hours	40	44.9
43 – 50 hours	39	55.1
≥ 50 hours	0	0
Department		
General Ward	35	39.3
Oncology Ward	22	24.7
Cardiology Ward	11	12.4
Obstetric Ward	8	9.0
Pediatric Ward	7	7.9
Surgical Ward	6	6.7
Previous work experience in other hospitals		
Yes	34	38.2
No	55	61.8

3.2 Measurement model

The outer loading from the reflective model was done in the first phase of PLS-SEM analysis to examine the indicator of reliability (outer loading). The result found 24 indicators met outer loading criteria, while four indicators NP1, NP2, NP4, NFO1, NMA1, and SR5 were excluded since the loading was below 0.708 (Figure 2). The second stage was to assess the model's internal consistency; all constructs had a Cronbach alpha of more than 0.60, as shown in the blue circles of the measurement model, and composite reliability had an upper threshold below 0.95, indicating that the model's constructs were reliable (Hair et al., 2019).
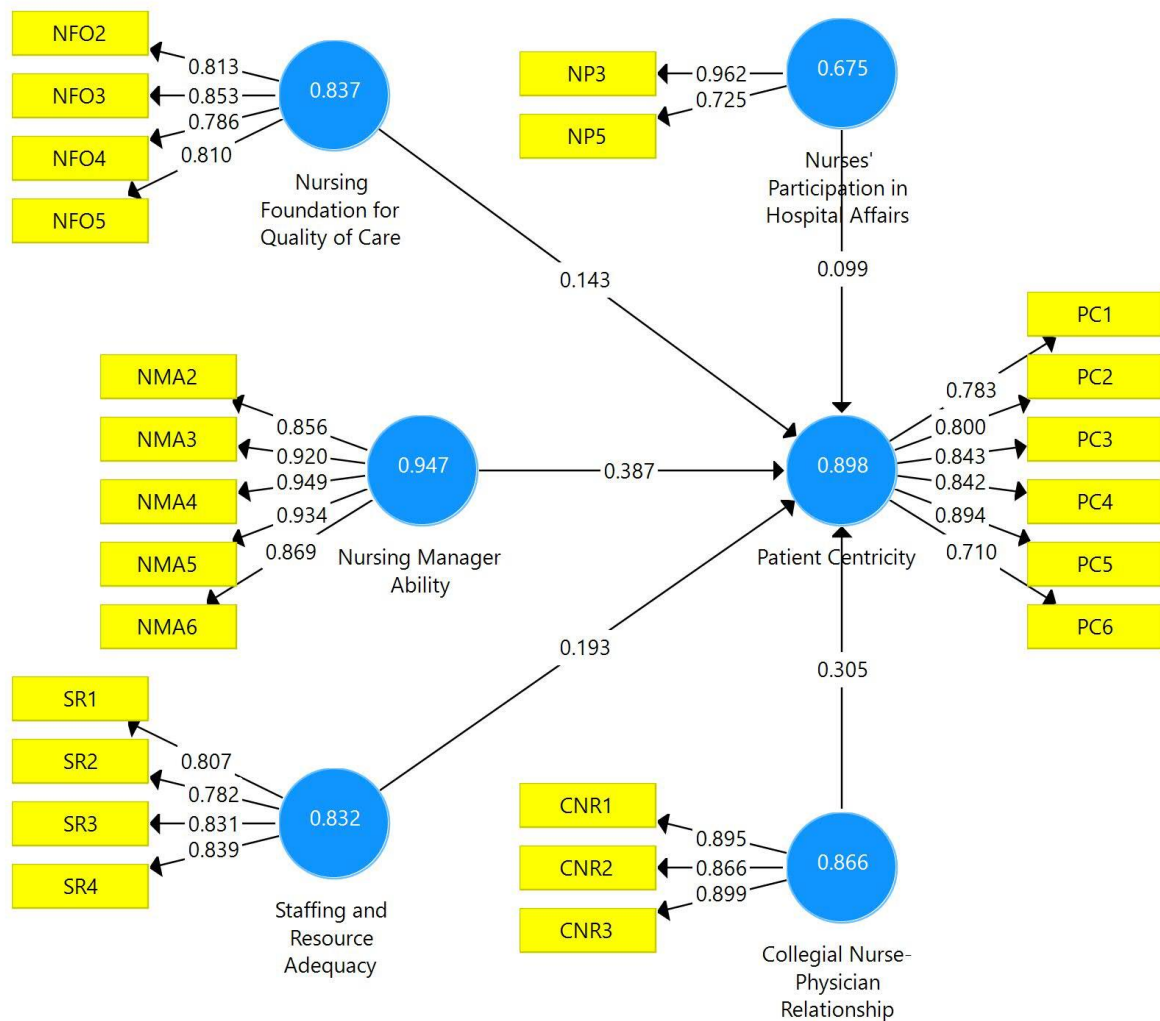
Figure 2. Measurement model

The average variance extracted (AVE) was used to measure convergent validity in the third stage. All constructions have an AVE of more than 0.50, as necessary, according to this validity check (Hair et al., 2019), showing all constructs can explain at least 50% of item variance in the model, thus establishing convergent validity. The research's reliability and validity can be seen in Table 2.

Table 2. Reliability and validity analysis

Variables	Indicators	Outer Loading	Cronbach's Alpha	Composite Reliability	Average Variance Extracted
Nurses' Participation in Hospital Affairs (NP)	NP3: Nurses have the opportunity to serve on hospital and nursing committees.	0.962	0.675	0.838	0.726
	NP5: Nurses are involved in the internal governance of the hospital.	0.725			
Nursing Foundation for Quality of Care (NFO)	NFO2: The hospital administration where I work has high expectations for standards of nursing care.	0.813	0.837	0.888	0.666
	NFO3: Patient care assignments at the hospital where I work can foster continuity of care.	0.853			

Table 2. Continued

Variables	Indicators	Outer Loading	Cronbach's Alpha	Composite Reliability	Average Variance Extracted
	NFO4: Nursing care at the hospital where I work is based on a nursing model, rather than a medical model.	0.786			
	NFO5: There is an active quality improvement program at the hospital where I work.	0.810			
Nursing Manager Ability (NMA)	NMA2: The nurse manager is able to back up the nursing staff in decision making, even if the conflict is with a doctor.	0.856	0.947	0.950	0.821
	NMA3: The nurse manager is highly visible and accessible to staff.	0.920			
	NMA4: The nurse manager uses mistakes as learning opportunities, not criticism.	0.949			
	NMA5: The nurse manager is supportive of nurses.	0.934			
	NMA6: The nurse manager listens and responds to employee concerns.	0.869			
Staffing and Resource Adequacy (SR)	SR1: There are enough staff to get the work done.	0.807	0.832	0.888	0.665
	SR2: There are enough registered nurses on staff to provide quality patient care.	0.782			
	SR3: Adequate support services allow me to spend time with my patients.	0.831			
	SR4: There is enough time and opportunity to discuss patient care problems with other nurses.	0.839			
Collegial Nurse-Physician Relationship (CNR)	CNR1: Doctors and nurses in the hospital where I work have good working relationships.	0.895	0.866	0.917	0.786
	CNR2: There is a lot of teamwork between nurses and doctors.	0.866			
	CNR3: There is collaboration (joint practice) between nurses and doctors.	0.899			
Patient Centricity (PC)	PC1: The inpatient ward team attains better job level through high equipment utilization.	0.783	0.898	0.921	0.663
	PC2: The inpatient ward team attains better job by eliminating waste.	0.800			
	PC3: The inpatient ward team attains a responsive attitude for patient safety.	0.843			
	PC4: The inpatient ward team attains a caring and courteous nature.	0.842			
	PC5: The inpatient ward team attain higher clinical quality than others.	0.894			
	PC6: The inpatient ward team attains minimum treatment errors and better efficiency.	0.710			

The discriminant validity of the measurement model is checked in the fourth phase using the Heterotrait-Monotrait (HT/MT) ratio. This method was chosen since it is known to provide a more exact result (Hair et al., 2019; Henseler et al., 2014). The recommended threshold value for HT/MT ratio is below 0.9 referring to Hair et al. (2019) to establish that each construct indicator is conceptually different. Table 3 demonstrates that all HT/MT values are well below the 0.9

threshold, implying that all indicators utilized in this study have sufficient discrimination to assess their own constructs. The four reliability and validity testing parameters were successively passed by this outer model analysis. Therefore, it can be concluded that all indicators in this research model are reliable and valid to measure their respective constructs specifically.

Table 3. Heterotrait-monotrait ratio

Variables	Nurses' Participation in Hospital Affairs	Nursing Foundation for Quality of Care	Nurse Manager Ability	Staffing and Resource Adequacy	Collegial Nurse-Physician Relationship
Nursing Foundation for Quality of Care	0.256				
Nurse Manager Ability	0.147	0.528			
Staffing and Resource Adequacy	0.194	0.432	0.527		
Collegial Nurse-Physician Relationship	0.102	0.409	0.412	0.517	
Patient Centricity	0.208	0.184	0.166	0.215	0.305

3.3 Structural model

The structural model analysis in this study was done with IPMA to provide inputs to managers to prioritize their improvement activities (Ringle & Sarstedt, 2016). This method is based on the importance that resulted from the total effect and performance based on the mean value. Priorly, the inner variance inflation factor (VIF) test was conducted to check multicollinearity issues. The findings showed all the constructs had inner VIF values below 5 as suggested (Hair et al., 2019) thus, it can be said that there is no multicollinearity issue found in this model. IPMA could be seen as four quadrants, whereas the focus on the quadrant with more importance and performance. Through IPMA analysis in the form of mapping, it can be seen which positions of variables and indicators have shown good performance and need to be maintained, and which still need to be improved. IPMA calculation results can be divided into construct IPMA and more detailed indicator IPMA, as described below (Table 4).

Table 4. Construct importance and performance

Variable	Construct Importance for Patient Centricity	Construct Performance for Patient Centricity
Nurses' Participation in Hospital Affairs	0.052	51.102
Nursing Foundation for Quality of Care	0.149	56.922
Nursing Manager Ability	0.294	34.563
Staffing and Resource Adequacy	0.191	64.550
Collegial Nurse-Physician Relationship	0.276	74.373
Mean	0.192	56.302

From Table 4, it is known the mean value for importance and performance for the patient centricity construct. The mean for importance and performance are 0.192 and 56.302, respectively. Values below this mean are considered low, while values above this mean are considered high. From this data, two lines can be drawn so that the four quadrants can be grouped in the graph as shown in Figure 3.

From Figure 3, it can be seen that the target construct of the research model is patient centricity, in the upper right quadrant there are collegial nurse-physician relationship and staffing

and resource adequacy. This quadrant shows important areas that have performed well. Thus, it can be said that collegial nurse-physician relationship and staffing and resource adequacy are considered important by respondents who are functional inpatient ward nurses in the general hospital. Therefore, it can be suggested for hospital managers to maintain the collegial nurse-physician relationship and staffing and resource adequacy in keeping a good work climate for implementing nurses to increase patient centricity among the nurses concerned. In the right lower quadrant, there is nursing manager ability which is a construct with the highest importance but has not performed well to realize patient centricity. Therefore, it is necessary to take a crucial step on the part of the hospital management to improve the ability of the head nurse in nursing leadership so that a good work environment can be established in clinical service for daily nursing practice.
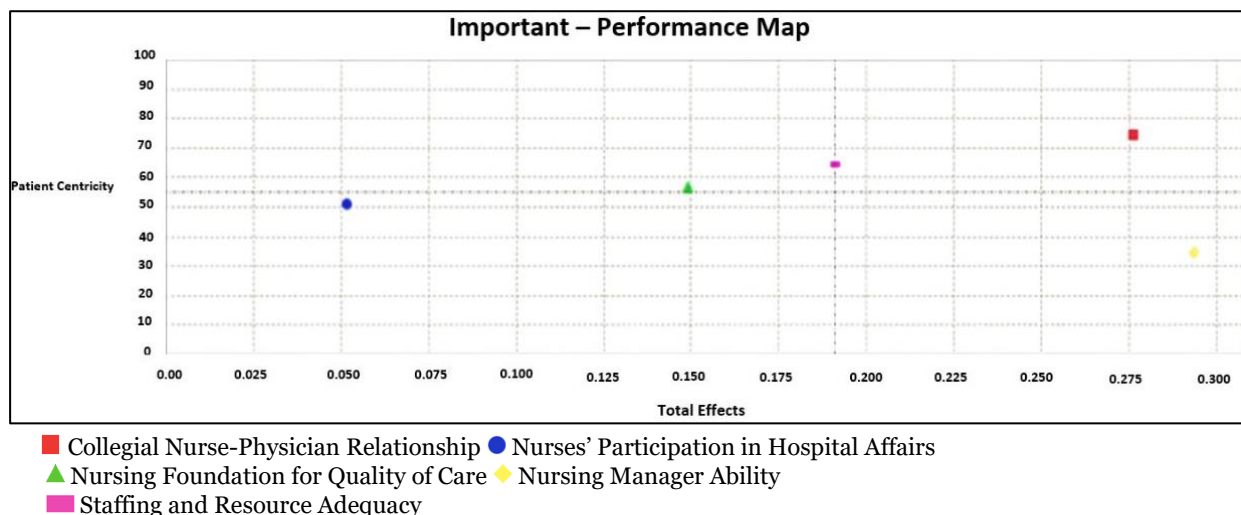

■ Collegial Nurse-Physician Relationship ● Nurses' Participation in Hospital Affairs
▲ Nursing Foundation for Quality of Care ◆ Nursing Manager Ability
■ Staffing and Resource Adequacy

Figure 3. Importance-performance map of constructs

More in-depth analysis can be done on the IPMA indicator. Table 5 shows the mean values for the importance and performance of the patient centricity construct for each indicator. The average indicator for importance is 0.053 and the average for performance is 54.874. Interpretation of values that are below or above that value is the same in principle with the construct IPMA.

Table 5. Indicator importance and performance

Variable	Indicator	Indicator Importance for Patient Centricity	Indicator Performance for Patient Centricity
Nurses' Participation in Hospital Affairs	NP3	0.038	47.753
	NP5	0.014	60.393
Nursing Foundation for Quality of Care	NFO2	0.027	60.674
	NFO3	0.050	62.921
	NFO4	0.037	61.049
	NFO5	0.036	41.573
Nursing Manager Ability	NMA2	0.029	31.742
	NMA3	0.056	36.236
	NMA4	0.070	35.112
	NMA5	0.049	34.551
	NMA6	0.090	33.989
Staffing and Resource Adequacy	SR1	0.050	57.303
	SR2	0.040	68.258
	SR3	0.052	70.225
	SR4	0.049	62.921
Collegial Nurse-Physician Relationship	CNR1	0.117	75.281
	CNR2	0.096	73.034
	CNR3	0.064	74.719
	Mean	0.053	54.874

From this data, two lines can be drawn so that the four quadrants can be grouped in the graph as shown in Figure 4.
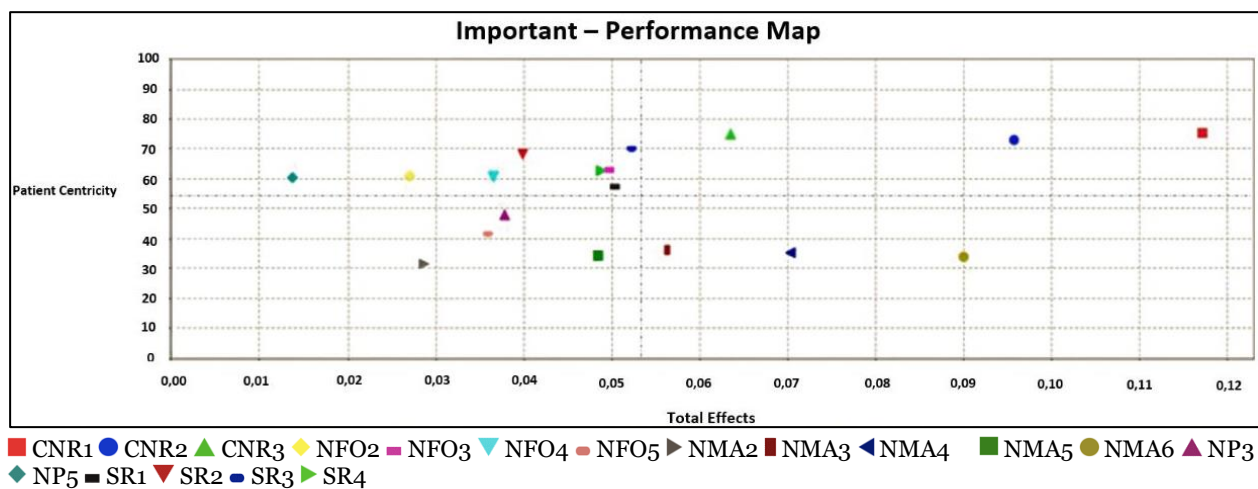
Figure 4. Importance-performance map of indicators

Figure 4 illustrates some indicators that are suggested to be noticed on which hospital management must pay more attention. Indicator CNR1 which contains respondents' responses that doctors and nurses in the hospital where they work have good working relationships, and CNR2 which contains respondents' responses that there is a lot of teamwork between nurses and doctors, have been sufficient and have shown adequate performance. Therefore, these matters need to be maintained by the hospital management because it is considered important for maintaining their motivation in implementing patient centricity in the hospital. On the other hand, in the right lower quadrant, there are indicators with high importance, but have not performed well to realize patient centricity. The indicators that are highlighted here are NMA6 which states that the nurse manager listens and responds to employee concerns, and NMA4 which emphasizes that the nurse manager uses mistakes as learning opportunities, not criticism. On this basis, it is necessary to take action from the hospital management regarding the guidance of the head nurse of the inpatient unit in conducting leadership in inpatient clinical service in relation to the implementing nurse.

As seen in the data analysis, the nursing environment has a weak predictive accuracy on patient centricity (R^2=0.213). Microdata on individuals, families, or households tends to have low R^2 because there is so much variation in individual perception (Crown, 1998). However, there is room for this research model to be tested in a larger and more diverse population of respondents for future research on the nursing environment and patient centricity of inpatient ward nurses.

4. Discussion

This study aimed to investigate the relationship between nursing environment dimensions and patient centricity in inpatient nurses. Five relationships between the six variables in this suggested model are being examined using IPMA. The results of this analysis show that the collegial nurse-physician relationship is a construct with high priority and adequate performance, while nursing manager ability is a construct with great importance but its performance still needs to be improved in supporting patient-centred care.

As it has been seen, IPMA is based on standardized regression coefficients (importance) and adds a new dimension to the analysis by taking into account the values of the predictor variables, which are now stated in terms of a scaled performance index from 0 to 100 (Salleh et al., 2017). The results demonstrated the overall impact of the nursing environment's independent factors on patient centricity, which was evaluated using a scale of latent scores ranging from 0 to 100. When making decisions to increase patient centricity, individuals in charge at the hospital will find these results useful. This study supports Gaalan et al.'s (2019) study, which found that the nursing environment positively impacted patient-centred care. However, these authors analyzed the relationship between both variables through a unidimensional aspect of the nursing environment

using hypothesis testing, and the present study has confirmed the positive relationship through a multidimensional approach. Both studies, however, include different samples of nurses and use PLS-SEM to examine the connections between the nursing environment and patient centricity. In addition to this research, there is another study by Peeler (2015) of nurses in a rural hospital in South Carolina which found no significant relationship between nurses' work environment factors and their perceptions of the quality of service to patients. In this case, autonomy in determining work schedules is what gives job satisfaction and provides an outcome in the form of a better perception of patient-centred care. This is also reinforced by a study conducted by Andy and Antonio (2022) in which health worker autonomy is the antecedent that has the most dominant relationship to work engagement in terms of its impact on patient centricity. This can be a consideration in explaining that there are factors outside of the nurse's work environment that can predict patient centricity beyond the 21.3% coverage of predictive accuracy contained in this study.

In summary, the results of the IPMA indicated that the most beneficial variable to improve patient centricity in inpatient ward nurses is nursing management ability. Ability referred to here is the perception of leadership shown by the head of nursing in the inpatient ward, instead of the level of the nursing directorate of the hospital. Precisely, this aspect would be related to the nursing manager's ability to accommodate the aspirations of his/her subordinates, the ability to learn from mistakes, the ability to support fellow nurses, and the ability to share and organize daily work in the inpatient ward. This is in line with research by Manning (2016) which found that nursing managers who support and communicate through transformational and transactional leadership styles can enhance organizational outcomes by enhancing staff nurses' work engagement. This study also claims that nursing managers' passive avoidant leadership styles have a detrimental impact on staff nurses' work engagement. This has an impact on the growth of the nursing profession and is consistent with the multicenter study by Gad (2018) on nurses in tertiary hospitals in Saudi Arabia, which found that organizational traits and nursing managers' leadership styles have a positive impact on the performance outcomes of nurses, including innovative behavior. A different insight was obtained from research by Abualrub and Alghamdi (2012) which suggested a less meaningful relationship between nurse leadership and nurse work involvement. This can be related to various leadership styles so that it can provide different outcomes on the performance of subordinates. For example, a study by Mehrad et al. (2022) revealed that transformational leadership, transactional leadership, and three outcome scales were positively related to nurse work engagement, but laissez-faire showed a negative relationship. These findings become a consideration for future research to include various types of leadership as moderating variables.

Nurses' participation in hospital affairs is the variable with the lowest importance among the five dimensions of the nursing environment in relation to patient centricity. This can be caused by the low participation of nursing staff in decision-making related to policies in this hospital environment. This is in line with the findings by Rawah and Banakhar (2022) who found an insignificant relationship between nurses' participation in hospital affairs and career commitment due to the limited space for them to participate in decision-making. In addition, this can also be caused by conditions where nurse participation in hospital policy-making and teamwork are extremely unfavorable, contested, and complex (Ditlopo et al., 2015; Ali & Wajidi, 2013). Nurses who were respondents in this study predominantly had less than 6 years of work experience, which was inferior to nurses who had more than 10 years of experience. This is related to their confidence in their involvement in determining hospital policies so that they are more likely to entrust it to their superiors (Jafree et al., 2016; Numminen et al., 2016). This form of trust makes the responsibility of a nursing manager to be great in increasing the patient centricity orientation of their subordinates for service optimization.

5. Implications and limitations

This research provides a new contribution to the field of nursing through IPMA analysis which shows the strongest dimension in its influence on the quality of health services as a correction material for hospital management. This model can be suggested to be replicated and tested in a larger and more diverse population of nurses in future studies. There are no similar studies that predict patient centricity with the dimensions of the nursing environment. In terms of managerial implications, this can be realized by evaluating and monitoring operational

standards in effective communication between health workers. To maintain staffing, hospital management needs to realize what is the goal of nurses working in the hospital concerned to maintain work engagement and prevent burnout which can ultimately have an impact on patient centricity. The adequacy of hospital facility resources is one of the factors that greatly support the work of nurses in implementing patient centricity. In increasing motivation and maintaining nurse performance in patient-centred care, management can make efforts to procure high-quality facilities by the repertoire of value-based procurement and periodically calibrate health facilities to prevent obstacles in service that affect the welfare of nurses. To improve nursing manager ability, leadership development is needed for the head nurse of the inpatient unit to strengthen the ability to lead and change the culture in nurturing subordinates so that kinship between nursing professionals can be established.

Several research limitations were found in this study as a concern for future research on similar problems regarding nursing environment and patient centricity. First, this study used a cross-sectional design for data collection. Nursing environment, in this case, can fluctuate in terms of workload, for example, during the current coronavirus disease 2019 (COVID-19) pandemic, natural disaster, or other conditions affecting the nurses' well-being and the perception of each respondent regarding their welfare at work. The author recommends that this study can be continued with a longitudinal design in the next research. Second, the data collection technique used in this study, an online questionnaire, has limitations because it was undertaken when the COVID-19 pandemic was still active. Online questionnaires have a flaw in that the respondents' health cannot be determined with precision. The mood of the respondent when filling out the questionnaire might have an impact on the results. Suggestions for future study include collecting data or handing out surveys to respondents in person while still following community health procedures. Finally, the small size of samples is an obstacle to be considered, so in future research, it is expected that this model can be tested on more samples to increase the precision of findings in the application of this model.

6. Conclusion

This study concludes that the nursing environment dimensions have a relationship with respective importance and performance towards patient centricity in inpatient ward nurses. Collegial nurse-physician relationship and staffing and resource adequacy are very important constructs and have performed well, so they need to be maintained from a managerial perspective to remain sustainable. On the other hand, nurse manager ability as a construct with the highest importance among all dimensions requires room for improvement to perform well to realize patient centricity in inpatient ward nurses. Maintaining the quality of current dimensions of the nursing environment can help obtain the optimal patient centricity.

There are several recommendations for further studies. First, this study was conducted in a limited number of samples with representative results. It is expected that a confirmatory analysis can be carried out with a larger number of samples. Second, there are dynamics in changes in responses from respondents in certain periods, especially during the COVID-19 pandemic era, so the authors suggest conducting a longitudinal study related to this model. Finally, this study has not considered confounding factors that can give heterogeneity to the data, so future research is expected to include control variables in the model, for example, marital status, length of service, training received, or other potential variables.

Author contribution

Conception and design of the study: A. Andy; Supervision: F. Antonio; Data collection: A. Andy, S.M.Z. El-Hamzah; Data analysis: A. Andy analyzed the data which was confirmed by S.M.Z. El-Hamzah and F. Antonio for accuracy; Drafting of the manuscript: A. Andy drafted the manuscript; Review and editing of the manuscript: F. Antonio. All the authors are in agreement of the final version of the manuscript.

Conflict of interest
    None declared

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