



## Influence Factors of Comfort in The Post-Anesthesia Care Unit

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### ABSTRACT

**Background:** Many factors influence pain in patients during transferring from the recovery room to the ward. All of these factors can come from the patient, the environment, the patient's experience and family support. This study aimed to identify the factors that influence comfort in the post-anesthesia care unit.

**Methods.** The research method was observational explanatory, utilising a sample size of 284 post-surgery and anaesthesia patients who fit the inclusion criteria in the Post Anesthesia Care Unit (PACU) room at Prof. Dr Margono Soekarjo Purwokerto Hospital. The instruments used were the Brief Illness Perception Questionnaire (Brief IPQ), Generalized Anxiety Disorder 7-item (GAD-7), Caring Behavior Inventor-24, Questionnaire on generic skills, PPE-15 and The Picker Patient Experience Questionnaire are two instruments used to measure patient experiences. Partial Least Square Structural Equation Modeling (SEM PLS) was employed in the analysis.

**Results.** The results revealed that health professionals and environmental factors affected comfort in developing PACT with a p-value of 0.000. At the same time, patient factors did not affect comfort in developing PACT, with a p-value of 0.344. This was due to several factors that influence patient factors such as the perception and anxiety of respondents after surgery and anaesthesia. After surgery, the patient's perception was primarily positive, and most anxiety were mild.

**Conclusion.** There was an effect of health professionals and environmental factors on comfort in developing the PACT model, but there was no effect of patient factors and the environment on comfort in developing the PACT model

**Keywords:** Comfort, health professional, patients, post-anesthesia care unit.



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## INTRODUCTION

Surgery is an integral part of health care in the world and there are an estimated 234 million surgical and anesthesia procedures each year. Studies in industrialized countries have an average mortality rate after surgery of 0.4-4% and a major complication rate of 3-17%. 40% of hospital complications are associated with surgery and 15% of surgical patients experience at least one complication such as bleeding, infection, respiratory and cardiac problems (congestive heart failure and pulmonary oedema).<sup>1,2</sup>

Data from some low and middle-income countries the prevalence of postoperative pain and anaesthesia increased up to 95%, moderate or severe pain was reported by 41% of patients on day 0, 30% on day 1 and 19%, 16% and 14% on days 2, 3 and 4. Studies show the prevalence of Post Operative Nausea and Vomiting (PONV) is 20%-30% in the normal population and 70%-80% in high-risk population.<sup>3,4</sup> The results of the study reported that the occurrence of post-surgical complications depends on the location, site, and procedure of surgery, as well as the method used to identify post-surgical complications. The surgery cost for patients with complications is greater when compared to those without complications. Intensive patient observation in the Post Anesthesia Care Unit (PACU) by nurses can detect complications early.<sup>5,6</sup> The impact of inadequate patient observation will lead to a longer duration of hospitalization, worsening clinical symptoms, and pain that is not tolerated.

Many factors influence pain in patients during transferring from the recovery room to the ward. All of these factors can come from the patient, the environment, the quality of health services provided by health professionals, the patient's experience and family support. Just paying attention to patient safety being transferred from the recovery room to the wards is apparently not enough to support patient satisfaction. Ignoring factors that influence patient comfort during transfer from recovery room to wards can actually affect the length of time to recover, the risk of complications. The preliminary study results also obtained data that the most common complications other than those contained in the Aldrete score were pain. This increases the incidence of unexpected events that harm the patient impacting the patient's discomfort.<sup>7,8</sup> Patient comfort needs to be considered during surgery, but seriousness in handling discomfort

during postoperative recovery and anaesthesia has not been a concern<sup>9</sup> Therefore, this study's purpose was to identify the factors that influence comfort in the post-anesthesia care unit. .

## METHODS

### *Study design*

This research used an observational explanatory design, which involves watching someone or something carefully and closely to learn something. This approach uses data collected during routine clinical care on comfort among patients from the recovery room to the ward. The purpose of this study was to analyse several factors that affect patient comfort based on patient factors including age, education, anxiety, gender, occupation, perception of illness, socioeconomics; health worker factors including caring behaviour and skills; and environmental factors including support systems and access systems based on Comfort Theory. Kolcaba's comfort theory was used as a basis to view comfort through various dimensions. All variables discussed in this study are adjusted to the dimensions in the comfort concept of Kolcaba

### *Setting*

This study was conducted at Indonesia's Purwokerto Regional General Hospital, by Prof. Dr. Margono Soekarjo.

### *Participants*

In the study population, the average number of patient visits for one month was 1000-1500 at Indonesia's Purwokerto Regional General Hospital, Prof. Dr. Margono Soekarjo. The sample was 284 patients with the inclusion criteria: patients with post-anaesthesia both general and regional, aged 18-65 years, with ASA cancer score of 1, duration of operation 1-2 hours, and post-surgery receiving analgesic therapy. Patients with post-anaesthesia, both general and regional.

The sample size is calculated using the rule of thumb formula, with a minimum sample size determined to be 5-10 times the parameter being estimated. The parameter estimated in this research is 21. The estimate of 21 was obtained from the 21 variables measured in this study. We used the highest estimated namely 10, therefore the sample size was  $21 \times 10 = 210$  respondents. To anticipate the loss of observation, 210 were added to the number of lost to follow 15%, the minimum sample required was  $n = 210 (1+0.15) = 242$  patients for each group. The sampling technique in this study was consecutive sampling.

**Table 1: The variable data**

Variable	Variable name	Indicator
X1	Patient factors	X1.1 Age X1.2 Education X1.3 Anxiety X1.4 Gender X1.5 Job X1.6 Perception of illness X1.7 Income
X2		X2.1 Caring behaviour
X3	Health Professional factors	X2.2 Skill X3.1 Support system X3.2 Access system
X4	Environmental factor	X4.1 Physic condition X4.2 Post-surgery and anesthesia education
Y1	PACT model based on Comfort Theory	Y1.1 Reliability Y1.2 Responsiveness Y1.3 Assurance Y1.4 Empathy Y1.5 Tangibles
Y2	Satisfaction	Y2.1 Education and information Y2.2 Family support Y2.3 Caring behaviour
	Patient Experience	

#### ***Data sources/measurement***

The measuring instruments used were the Brief Illness Perception Questionnaire (Brief IPQ), Generalized Anxiety Disorder 7 (GAD-7), Caring Behavior Inventor-24 (CBI-42), Questionnaire on Generic Skills, Support System Questionnaire, and PIECES Questionnaire. The parameters used to assess comfort were patient experience and patient satisfaction.

#### ***Data and statistical analysis***

Partial Least Square (PLS), a variance- or component-based structural equation modelling (SEM) approach, was the analysis method employed. Smart PLS software, which contained an outer model for measurement, an inner model for structural modelling, and hypothesis testing, was used to perform SEM-PLS analysis.

## **RESULTS**

### ***Convergent Validity***

Using the outer loading value or loading factor, the convergent validity was tested. If the outer loading value is greater than 0.7, an indicator was deemed to achieve convergent validity in the good category. Chin, cited by

Ghozali, asserted that the outer loading value in the range of 0.5 to 0.6 was adequate to satisfy the convergent validity criterion.

The value of each indicator's outer loading on the research variable is as follows: (initial):

The test revealed that X1\_3, X1\_4, X1\_5, X1\_6, X1\_7, X3\_1, X3\_3, Y1\_1, Y1\_4, and Y1\_5 had loading factor values below 0.5. As a result, these indicators had to be removed because they did not satisfy the predefined test criteria. The model that resulted from removing the indicator from the model was as follows:

Since none of the indicator variables in the aforementioned data have an outer loading value less than 0.5, all of the indicators are deemed viable or viable for study and can be applied to additional analysis.

### ***Differential Validity***

The findings of the discriminant validity test will be discussed in this section. The cross-loading value is used in the discriminant validity test. If an indicator's cross-

loading value on a variable is the highest when compared to other variables, it is said to meet discriminant validity.

Each indicator on the research variable has the most significant cross-loading value on the variable it creates in comparison to the cross-loading value on other variables, as can be seen from the data shown in **Table 1**. It is possible to conclude from the results that the

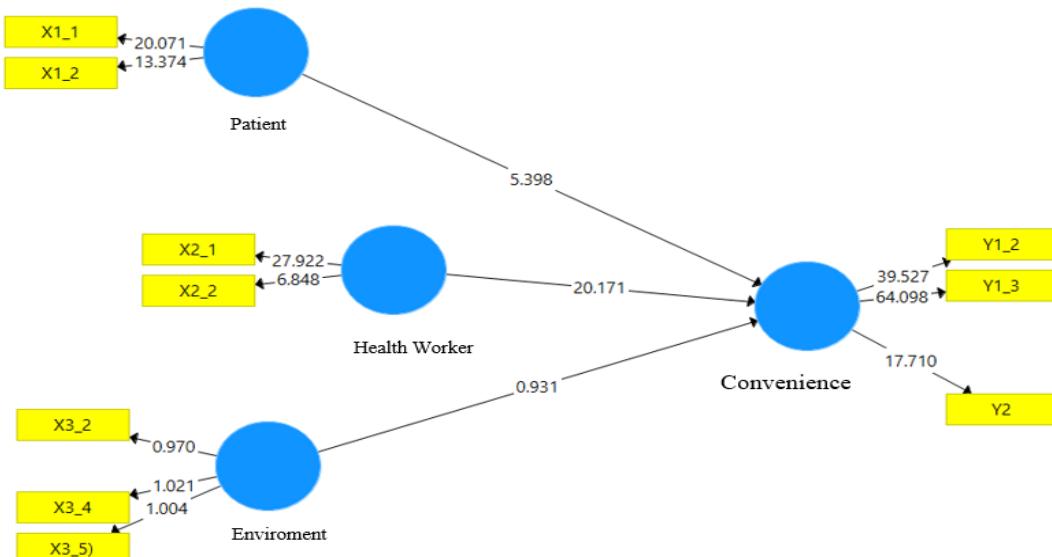
indicators employed in this study have strong discriminant validity when it comes to constructing the variables that they correspond to. Apart from the cross-loading value, there exist alternative approaches to ascertain discriminant validity. One such method is to examine the average variant extracted (AVE) value for every indicator; a high-quality model requires that the value be more than 0.5

**Table 2** Cross-Loading Results

Indicator	Variable			
	Patient	Health Professional	Environment	Convenience
X1_1	0.802	-0.516	-0.388	-0.450
X1_2	0.649	-0.158	-0.050	-0.352
X2_1	-0.087	0.792	0.659	0.670
X2_2	-0.0676	0.535	0.135	0.484
X3_2	-0.202	-0.409	-0.606	-0.429
X3_4	-0.328	0.086	0.347	0.032
X3_5	-0.595	0.443	0.706	0.032
Y1_2	-0.701	0.745	0.689	
Y1_3	-0.311	0.827	0.437	
Y2	-0.190	0.365	0.397	
Composite	0.831	0.619	0.090	0.831
Reliability				

The component that tests an indicator's reliability value on a variable is called Composite Reliability. If a variable's composite reliability value is greater than 0.6, it can be stated to meet composite reliability.

The following is the composite reliability value of each variable used in this study:



**Figure 1** Inner Model



It is clear from the inner model scheme displayed in **Figure 1** above that the influence of medical experts on comfort (20.171) indicates the most significant path coefficient value. Next, the patient's impact on comfort (5.398) is the second most significant influence, while the environment's impact on comfort (0.931) is the least significant.

All of the variables in this model have positive path coefficients, according to the explanation of these results. This indicates that the influence of the independent variables on the dependent variable is stronger the bigger the value of the path coefficient on one of the independent variables.

#### Test of the Model's Goodness of Fit

Using the clever PLS 3.0 program to process the data, the following is the resultant value for the R-Square:

**Table 3** R-Square value and hypothesis.

Domain	Original Sample	Sample Mean	2,5%	97,5%	Hypothesis	Effect	T-Statistic	P-Value	Results
Patient of Convenience	-0.171	-0.176	-	-0.116	H1	Patient =>Convenience	5.209	0.344	Accepted
Health Professional of Convenience	0.671	0.667	0.240	0.725	H2	Health Professional => Convenience	20.753	0.000	Accepted
Environment of Convenience	0.172	-0.002	0.595	-	H3	Environment => Convenience	0.946	0.000	Rejected
				0.206					
				0.265					

It is evident from the data in **Table 2** above that the environment variable's R-Square value is 0.206. This value's acquisition explains why the surroundings can account for 20.6% of comfort. The patient variable then yielded an R-squared value of -0.116. The patient's ability to articulate comfort at -11.6% is explained by this value. Next, we look at the R-squared value of 0.725 that the health professional variable yielded. This figure indicates that 72.5% of health experts can explain comfort.

The Q-Square number provides information on the goodness of fit evaluation. Similar to the regression analysis's coefficient of determination (R-Square), the Q-Square value indicates how well or highly the model fits the data; the higher the Q-Square number, the better. The following are the findings from the computation of QSquare's value:

$$\begin{aligned} Q\text{-Square} &= 1 - [(1 - R^2 1) \times (1 - R^2 2) \times (1 - R^2 3)] \\ &= 1 - [(1 - 0,206) \times (1 - (-0,116)) \times (1 - 0,725)] \\ &= 1 - (0,794 \times 1,116 \times 0,275) \\ &= 1 - 0,244 \\ &= 0,756 \end{aligned}$$

Based on the aforementioned computation findings, a Q-Square value of 0.756 was determined. This demonstrated that 75.6% of the variability of the study data could be explained by the research model. While the remaining 24.4% was explained by variables not included in this study model. Therefore, based on these findings, it can be said that the study model has a good goodness of fit.

The data processing that has been done, as shown in **Table 2**, can be utilized to respond to the study's hypothesis. In this study, the T-statistics and P-values were examined to conduct hypothesis testing. If the P-Values are less than 0.05 and the T-Statistics value is greater than 1.96, the study hypothesis can be accepted. With a P-value of less than 0.05 for each of the three hypotheses put out in this study, **Table 2** demonstrates that they are all acceptable. Thus, it may be said that there is a strong influence from the independent variable to the dependent. It is clear from the inner model scheme displayed in **Figure 1** above that the influence of medical experts on comfort (20,171) indicates the most significant path coefficient value. After that, the patient's influence on comfort (5.398) is the second-most significant factor, while the environment's influence (0.931) has the least impact. The outcomes of the hypothesis testing that this study's inner model produced are listed below. The evaluation of the goodness of fit is determined by the Q-Square value (0.756). This demonstrates that 75.6% of the variation in study data can be explained by the research model. On the other hand, the remaining 24.4% are explained by

variables not included in the research model. It is possible to declare this study model to have good goodness of fit.

## DISCUSSION

The data shows that comfort theory is influenced by patient factors, although not significantly. According to Kolcaba's theory, factors that affect comfort consist of internal factors, namely patient factors and external factors, namely health workers and environmental factors.<sup>10</sup> The indicators studied based on patient factors include age, education, anxiety, gender, income, occupation and perception of illness. Other factors that are not studied include attitudes, counselling needs, emotional intelligence, cultural background, social interaction, and personal health care. Anxiety is a valid indicator of patient factors based on comfort theory, this is by research that anxiety has a negative relationship with comfort.<sup>11</sup> The higher the anxiety, the less comfort. Anxiety is influenced by gender. Anxiety that occurs in perianesthesia can be related to age, gender, education level and married status. According to the results of research, anxiety is higher in women. This is because women are more sentimental than men.<sup>12</sup> Based on this study, most of the respondents were female, so based on the researcher's assumption, there were moderate and severe anxiety results due to one of them being the type of gender.

Comfort theory is influenced by health worker factors, although it is not significant. Based on the results of the study, the health worker factors studied were caring behaviour and skills. Based on this figure, the indicator factor that is meaningful to health factors is the caring behaviour of health workers. Based on Hall's theory, the care provided which includes aspects of the Care, the Core and the Cure is an integral part of the caregiver with the outcome being patient comfort.<sup>13</sup> These internal and external factors are an integral part that can influence the use of PACT instruments.

According to the results of the study, caring health workers affect the level of patient comfort and satisfaction. Increased comfort felt by patients from health workers not only makes patients behave to seek health services but also affects the integrity of institutions (health services) that provide services.<sup>11</sup>

Internal variables or patient factors made up of physical, psycho-spiritual, socio-cultural, and environmental elements, were aspects that influenced comfort. In addition, professionals make up the external components, which also comprise environmental, sociocultural, psychological, and spiritual aspects. Health

professionals, patients, and environmental factors are the components that affect comfort in the most significant order.<sup>14</sup> Age, gender, educational attainment, occupation, socioeconomic status, perception, and anxiety were among the patient characteristics examined in this study, according to the findings. Caring conduct and abilities were the criteria investigated for health professionals. The access system and support system are the environmental factors that were examined. Depending on their experiences, various people will define comfort differently.<sup>10</sup>

Comfort is influenced by a variety of elements, such as the sickness, the patient's assessment of their condition, surrounding conditions, and the extent to which the patient's requirements are addressed. The younger patients scored higher on comfort, although the difference was not statistically significant. Furthermore, they discovered that there were notable between-group variations and greater comfort levels among patients who were married and had completed college. Not surprisingly, these factors decreased the patients' comfort level.<sup>15</sup> Patients reported that several factors were stressful, including the surroundings, being connected to the device, being around a patient with a severe health condition, not having personal needs met due to the influence of anaesthesia, being around too much noise, and not having visitors. More than 97% of patients said that ensuring their physical comfort is crucial, and the two biggest things that get in the way of that comfort are pain and becoming immobile from watching connected devices.<sup>16,17</sup> The biggest stresses are being in public places with other people and not having privacy. Patients' main sources of stress included hearing other patients scream and cry, not having their privacy, being in a cold setting, and seeing men and women together.<sup>18</sup>

Hospital nurses' actions have a direct impact on how comfortable their patients end up being. Knowledge-based behaviour is typically enduring.<sup>19</sup> Nurse behaviour has a considerable positive impact on patient comfort, as demonstrated by the data analysis conducted for this study. In other words, the patient will be more comfortable with the better and higher behaviour level the nurse possesses. When providing nursing care to a patient, courteous and protocol-abiding nurses' behaviour is evident. Because people express happiness with the services they receive, nurses are therefore highly competent and possess sufficient expertise to make patients feel comfortable. The study's findings indicate that environmental factors have an impact on 0.931. Patient characteristics had no statistically significant

impact. This is because of several patient-influencing factors, including respondents' perceptions and levels of anxiety following anaesthesia and surgery. Following surgery, most patients report feeling mostly better and experiencing just a little anxiety.

Reaching patients and families is made easier by a well-organized mobilization system in the hospital. Furthermore, a room that is intended to keep the patient comfortable is much helped by maintaining a steady temperature, sufficient ventilation, and illumination. The recovery room is no different from a frigid room; ventilation is still an issue in certain hospitals, and poor lighting is one of the factors that makes patients feel uncomfortable. Following anaesthesia and surgery, complications can include discomfort, nausea, vomiting, and freezing chills. Three sequences of respondents' feelings of disturbed comfort were pain, chills, nausea, and vomiting, according to the results of the questionnaire used in this study. Health professionals have the most influence—up to 20,171—among them. The comfort level of behaviour, surroundings, spatial planning, and service quality is 94.7%. According to this study, comfort, atmosphere, quality, and spatial planning are all significantly impacted by the actions of health professionals, and these effects occur simultaneously for each behaviour.<sup>16,20,21</sup>

Comfort has a major impact on an individual's sense of service quality, which in turn affects satisfaction levels. It will result in feelings of both happiness and discontent with the service, depending on the individual. Additionally, this will have a big impact on people's willingness or want to use the service. Patients who are happy with the facility will eventually attempt to utilize it and notify the public about its benefits.<sup>22</sup> Attitudes, motives, interests, experiences, expectations, age, education level, background, financial status, culture, occupation, personality, and individual experiences can all have an impact on this.<sup>22-25</sup>

### Implications of the findings

The data of this study show that health professional services have the largest influence on patient comfort. From this condition, hospitals should improve the caring ability of health workers towards patients so that patient comfort can be achieved and then patient satisfaction achieved.

### Strengths and limitations

Comfort has different meanings and expressions from region to country, so the results of this study cannot be



generalized. Further multicenter and multi-country study needs to be carried out to obtain generalizations

## CONCLUSION

Several factors influence comfort, and the influence of health professionals has the most significant influence, followed by the second most considerable influence, the patient factor, and the influence of the environment indicates the smallest influence. This is because health professionals are the primary key to providing services to clients

## DECLARATIONS

**Ethical Consideration:** This research has passed the ethical review of RSUD Prof. Dr Margono Soekarjo Purwokerto with ethics review number: 420/04592

**Authors' contributions:** All authors contributed to this research, including Conceptualization, methodology, and writing of the original draft Formal Analysis and Investigation Carried out by Rahmaya Nova Handayani. The data curation, resources, visualization and the writing – review & editing and project administration by M. Aryadi A and Satriya Pranata. Validation, Supervision and Funding acquisition by Rahmaya Nova Handayani and Satriya Pranata. All authors have read and agree to the published version of the manuscript

**Conflict of Interest:** The authors affirm no conflict of interest in this study

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