

ORIGINAL RESEARCH

PERIOPERATIVE MEDICINE

The effectiveness of patient discharge time in One-Day Care (ODC) surgical patients based on PADSS scoring

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ABSTRACT

Background & objective: One-day surgery, defined as ambulatory surgery, is a service that provides surgery in certain cases without requiring hospitalization to minimize the cost incurred by one-day surgery service users. The objective of this study was to measure the ideal time for discharge of patients undergoing outpatient surgical procedures prospectively based on the cut-off time of the maximum PADSS (Post Anesthesia Discharge Scoring System) score.

Method: This prospective observational study was conducted at a single site. The following patients were included in the inclusion criteria: Patients admitted to the one-day care clinic for scheduled day surgery procedures. Discharge was validated by PADSS scores ≥ 9 , following the surgeon's approval and return from the operating room.

Results: 76 volunteered patients were assessed using PADSS after returning from the operating room. Heart rate, blood pressure, and oxygen saturation were assessed intraoperatively. The findings revealed that the patients obtained a maximum PADSS score of ≥ 9 at the three-hour based on the cut-off time of PADSS. There was no significant correlation between the duration of the surgery and how long the patients get the ideal time to discharge.

Conclusion: PADSS for one-day care patients can estimate the patients discharged in less than 24 h. Patients obtained a maximum score at the three-hour and returned home in optimal condition.

Abbreviations: ODC- One Day Care; PADSS- Post-Anesthesia Discharge Scoring System;

Keywords: ODC; Ambulatory Surgical Procedures, Patient Discharge, Post Anesthesia Discharge Scoring System.

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1. INTRODUCTION

In 2012 there were 148 million patients in all hospitals worldwide who underwent surgery, while in Indonesia, 1.2 million patients underwent surgery.¹ The patients should not have nausea, vomiting, dizziness, active bleed, and high pain score within 20 min post-surgery, be able to mobilize, and the patients get a maximum score of

PADSS (Post Anesthesia Discharge Scoring Systems) ≥ 9 .² PADSS results in a faster and safer discharge, with most patients going home within one to two hours.³ This research focuses on measuring the ideal time for discharging patients based on a maximum PADSS score. We hypothesized that the patients obtain a maximum score of PADSS more than 2 h after surgery, in which

case the procedure and anesthetic management possibly influence time discharge in ambulatory patients.

Literature review

One-Day Care (ODC) is a surgical service the hospital provides to patients in surgical services that can be completed within 24 h. The principle of ODC service is to transfer as many patients as quickly as possible, especially for surgical patients. Medical technology advancements have resulted in a fast growth in the usage of ambulatory surgery. The introduction of fast- and short-acting anesthetics, analgesics, muscle relaxants, and enhanced brain monitoring techniques, have reduced anesthetic problems after recovery. Because of advancements in surgical technology, surgeons can now undertake more invasive procedures and complex healthcare treatments on an outpatient basis.⁴ Cost reductions, anesthetic breakthroughs, and surgical innovations are all factors driving the expansion of ambulatory surgery.⁵ In Indonesia, one-day care service is regulated by law. The government states that the cost of ODC services charged to patients is determined based on direct costs based on the community's economic capacity and other non-commercial local hospital rates.⁶ Furthermore, the ODC service offers various advantages to patients, including lower prices, shorter wait times, and a lower chance of cross-infection.¹ Increased of ambulatory general surgery in an older and more complex patient group raises safety concerns.⁷ In general, ambulatory surgery patients have a low morbidity rate of less than 1%.⁸

Patients in ODC services are allowed to go home if they have been fulfilling the Post Anesthetic Discharge Scoring System (PADSS). PADSS is a method to monitor the progress of one-day care patients after anesthesia in the recovery rooms so that it may be determined whether the patient is allowed to go home or requires further observation. The length of post-operative pain varied according to the procedure, with tonsillectomy causing more pain than orchiopexy or inguinal hernia surgery.⁹ In addition to differences due to procedure-specific variables, the choice of anesthetic agents or adjunct drugs, as well as parental considerations, can all have an impact on post-operative pain.

Criteria for the patient allowed to go home if the vital signs are stable for more than 20 min. However, several factors could delay the patient's discharge, such as pain, post-operative nausea and vomiting, hypotension, dizziness, unsteady gait, and the patient's assistance.⁹ Post-operative nausea and vomiting are one of the possible side effects of anesthesia, appearing in 30% of non-random individuals and more to 70% of high-risk individuals within 24 h following emergence.¹⁰ It is not

uncommon for ambulatory surgery to have a lower incidence than hospitalized surgery. Still, post-operative nausea and vomiting may be under-recognized in the outpatient clinic when patients frequently leave direct medical monitoring. Post-operative nausea and vomiting treatment necessitates the use of antiemetic agents from a different pharmacological class than the original preventative medications, and low-dose 5-hydroxytryptamine receptor antagonists are advised unless prophylaxis is necessary.¹¹

Based on Palumbo (2013), PADSS considers five critical factors: vital signs (blood pressure, pulse rate, respiration rate, and temperature), ambulation, nausea/vomiting, pain, and bleeding.² The patients must get a maximum score of PADSS ≥ 9 and the presence of a family to support discharging at home. Measuring and analyzing a patient's recovery, progress, or deficiency is more accessible by assigning the attribute to a numeric value.² With the advent of shorter and faster-acting anesthetic medicines in recent years, it has been observed that some patients may be eligible to bypass PACU phase I or the idea of fast-tracking or shifting quickly from PACU phase I unit to Phase II unit utilizing psychological grading systems.¹²

PADSS allows direct assessment and estimation of patient readiness for discharge and a mechanism for routine or repeated patient evaluation, which improves patient monitoring. Compared to clinical discharge standards, PADSS leads to a speedier and safer clearance, with most patients returning home within one to two hours. Observe and document the development of individual patients undergoing various surgical procedures and anesthesia treatments to establish their level of home readiness.³

2. METHODOLOGY

This study involved 76 patients who came to a one-day care clinic in a private hospital in Yogyakarta between November 2021 and April 2022. They scheduled an outpatient surgery (One-day surgery). This research was approved by the ethical committee (072/EC-KEPKFKIKUMY/III/2022). In order to maintain anonymity, all information regarding the patient's identity is treated with confidentiality, and all data is presented as group data.

2.1. Study design

This study used a cohort observational design. It involved 76 people aged 18 to 60 years who were hospitalized at a one-day care clinic or scheduled for elective minor surgery under general anesthesia. Patients with substantial comorbidities such as cardiovascular, gastrointestinal, renal, or respiratory disease and those receiving emergency surgery were excluded. The

Table 1: Demographic information

Characteristic	Result
Age (y)	31.59 ± 14.49
Height (cm)	155.68 ± 12,93
Weight (Kg)	57.64 ± 14.80
Body Mass Index (Kg/m ²)	13.32 ± 4.35
Gender	
Male	21 (27.6)
Female	55 (72.4)
Induction	
• Propofol	58 (76.3)
• Recofol	12 (15.8)
• Combination propofol	4 (5.3)
• others	2 (2.6)
• General anesthesia	76 (100)

Data presented as mean ± SD or n (%)

patients gave informed consent after the institutional ethics committee approved the procedure. The pre-operative vital signs of each patient were recorded.

2.2. Study method

All patients received the PADSS scoring system, calculated for each patient after surgery. The inclusion patient's characteristics were the patients aged ≥18-79 years old, were scheduled one day care surgery, and received ambulatory surgery with a duration procedure of around 15-30 min. The following parameters were measured: pulse rate, blood pressure, SpO₂ on room air, respiration rate, temperature, and nausea/vomiting score.

Table 2: The differences vital sign pre- and post-surgery

	Pre-operative	Post-operative	P
Temperature	36.46 ± .35	36.39 ± .40	0,263 [§]
Herat rate	83.08 ± 10.29	78.13 ± 12.50	0,005 [#]
Respiration Rate	19.51 ± 2.12	19.57 ± 1.48	0,877 [§]
Systolic BP (mmHg)	118.11 ± 19.41	113.88 ± 16.71	0,002 ^{*§}
Diastolic BP (mmHg)	75.57 ± 10.04	73.27 ± 8.88	0,023 ^{*§}
SpO ₂ (%)	98.89 ± .81	98.81 ± 1.40	0,965 [§]

* P < 0,05, # Independent T test, § Mann Whitney; Data presented as Mean ± SD

Table 3: Cut-off time ideal time of discharging patients based on PADSS score

	Mean ± SD)	Median	Minimum	Maximum
Time of PADSS	3.24 ± .88)	3.00	2.00	6.00
The duration of Surgery	25.39 ± 9.79)	30.00	5.00	75.00

*SD- Standard Deviation

Based on the PADSS scoring system, vital signs were acceptable for patients if: the pain score was < 3, oxygen saturation was 93%, the temperature was >36°C, nausea and vomiting were controlled, and mobilization, then patients were deemed ready for discharge. The observation was conducted after the patients underwent surgery and stayed in the monitoring room. The minimum sample size was calculated as 68 patients based on the pairwise comparison.

2.3. Statistical analysis

Statistical analysis was done using the statistical software for the Social Science system version 20. (Version 20.0; SPSS Inc., Chicago, IL, USA). Continuous variables are represented by the mean (standard deviation), while actual numbers and percentages represent categorical variables. The correlation discharging time with the duration of surgery was performed using Spearman Correlation Test, and Mann Whitney with P < 0.05 was considered statistically significant, for vital signs pre- and post-surgery was measured using independent T-test P < 0.05.

3. RESULTS

The data showed that the mean age was 31.59. Most patients were female 55 (72.4%) and male 21 (27.6%).

During surgery, the patients received propofol 58 (76.3%), recofol 12 (15.8%), propofol combination 4 (5.3%), and others 2 (2.6%). All respondents received general anesthesia. Their average height is 155.68 and, their weight is 57.64, body mass index 13.32.

There was no statistically significant difference in temperature, respiratory rate, and SPO₂ before and after surgery (P > 0.05). In contrast, the heart rate significantly decreased (P = 0.005). Systolic blood pressure also decreased (P = 0.002). Diastolic blood pressure also decreased (P = 0.023) (Table 2).

Based on Table 3, the ideal time to discharge patients is 3.24 h, with 2-6 h. The mean duration of surgery was 25.39 min, ranging from 5 to 75 min. This result means that the cut-off time for patients to get a

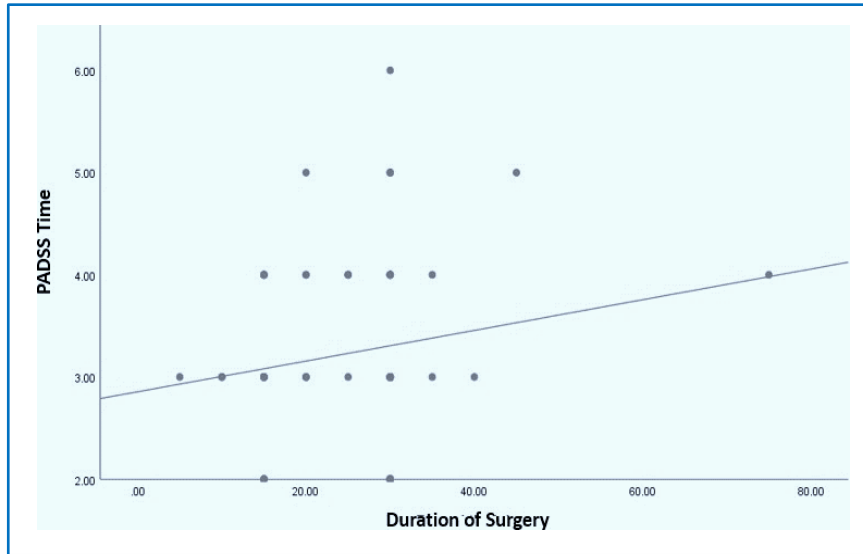


Figure.1 The correlation of ideal time in discharging patients based on PADSS score towards the duration of surgery

maximum PADSS score is 3 h after surgery.

The correlation coefficient of ideal time in discharging patients based on PADSS towards the duration of surgery was 0.095 ($r < 0.2$), with $P > 0.05$, as determined by Spearman Correlation test

There was no relevant correlation between the length of operation and the ideal time for discharging patients based on a PADSS score of $P = 0.415$. The coefficient correlation showed $r = 0.095$ has a positive point that means the higher the duration of the surgery, the higher the PADSS time, but the correlation of the relationship between the two variables in the very weak category, namely the value of correlation coefficient < 0.2 . (Figure.1 The correlation of ideal time in discharging patients based on PADSS score towards the duration of surgery).

4. DISCUSSION

Seventy-six patients underwent one-day surgery at a private hospital in Yogyakarta, Indonesia. This study focused on a prospective method in which data were taken from medical records. During the study, there was no significant difference between the surgical procedure and the discharge time of the patients. The correlation coefficient $r = 0.095$ is positive, meaning that the higher the duration of the action, the higher the ideal time to get the maximum value on PADSS. In addition, the close relationship between the two variables in the category is very weak, with a value of $r < 0.2$, because each patient has a different recovery time. According to Chung (1995) 96% of patients with dilation and curettage can be discharged 2.5 h postoperatively using PADSS.

Chung (1995) also argues that patients in the more extended anesthetic group will have a longer discharge time as well.¹³

Palvin (1998) mentioned that anesthetic techniques are the most important determinant in a patient's discharge to ambulatory surgery.¹⁴ Palvin et al. also said gender and type of surgery appear to play a role in determining discharge time. According to Palvin's research, additional characteristics of significance for women who underwent general anesthesia are the surgery time and the kind of general anesthesia. Discharging time was substantially linked with the type of surgery and operative duration in men. Palvin observed

that the fastest discharge time in women was after propofol induction and the slowest after thiopental induction following general anesthesia.¹⁴ Recovery after using general anesthesia is a complex process that can be broken down into several stages.¹⁵ Anesthesiologists used propofol to speed up recovery for patients. It was chosen to use propofol. Propofol is also characterized by fast elimination once administration has ceased.¹⁵ In this research, we did not observe the correlation between discharging time towards gender.¹⁶ Cai et al. said that the patient's sex, duration of anesthesia, and surgical procedure influence post-operative pain, which affects deciding discharging time for patients.

We also found that the cut-off time at which the patient scored the maximum on the PADSS score was 3 h after leaving the operating room. Since this is a one-day operation, it is natural for the patient's recovery to take under 24 h. In this study, patients received dilation, curettage, PILA, and other minor surgeries. According to Chung (1995), the actual postoperative discharge time for dilation and curettage patients was 170 min, while for minor surgery patients, it was 220 min.¹³ Several studies regarding the outcome of one-day surgery found that unexpected reception within the first 24 h after surgery varies widely, primarily due to bleeding and pain. The average complication rate is around 2%, such as bleeding and infected wounds.¹⁷⁻¹⁹ Efficient and comprehensive monitoring of one-day care is required to fully identify opportunities for the safe discharge.

The Post Anesthetic Discharge Scoring System is based on six criteria: vital signs (blood pressure, pulse, temperature, and respiration rate), ambulation,

nausea/vomiting, pain, surgical bleeding, and fluid intake/output.² Pre- and post-surgery vital signs such as temperature, respiratory rate, and SpO₂ did not show statistical differences. However, heart rate and heart pressure showed a difference. The decrease in heart pressure and heart rate shows a normal direction, which means the patient is showing a recovery condition. Pain, state of consciousness, vital signs, and nausea and vomiting were the most frequently excluded evaluation tool variables.^{19,20} However, heart rate and heart pressure showed a difference. The decrease in heart pressure and heart rate shows a normal direction, which means the patient is showing a recovery condition. Pain, state of consciousness, vital signs, and nausea and vomiting were the most frequently excluded evaluation tool variables.²¹⁻²³ According to Gartner et al., discharge with oxygen administered via a nasal prong may be appropriate.²³

5. LIMITATIONS

Our study had a limitation due to the small sample size because the number of patients undergoing surgery a day during the study period was only 76 people. So large multi-center studies are required, which may open new findings of ideal discharge time in ambulatory surgery.

6. CONCLUSION

PADSS for one-day care patients can estimate the patients discharge in less than 24 h. The patient obtained the maximum score at three h and returned home in optimal condition. We also found that heart pressure and heart rate (83 to 87) had significant differences before and after surgery. There is no relationship between the duration of the operation and the ideal time for the patient to be discharged. Still, we found that the longer the duration of the operation, the longer the patient gets the ideal discharge time.

7. Data availability

Numerical data generated in this research is available with the corresponding author, and can be made available on a reasonable request.

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9. Conflict of Interest

We declare that there is no potential conflict of interest in this publication.

10. Funding

No external funding was involved in the study.

11. Authors Contribution

NM: Concept and design, analysis the data, writing and editing the manuscript, final approval

FRA, AW: Concept and design, reviewing the manuscript, final approval

RL: Acquisition of the data, literature search

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