Effects of Mobile Application Education for the Practice of Anesthesia in Patients Undergoing Day Surgery

Wantana Boonkong

Department of Anesthesia Nursing, Lampang Hospital, Thailand

ABSTRACT

OBJECTIVES: This quasi-experimental study aimed to investigate the effects of the "Application ODS" mobile app on educating one-day surgery (ODS) patients about anesthesia practices, specifically its impact on their knowledge and clinical outcomes.

METHODS: The sample consisted of 62 ODS patients at Lampang Hospital, randomly divided into experimental (n=31) and control (n=31) groups. The "Application ODS," a general information questionnaire, a knowledge assessment form, and a clinical outcome record form were utilized. Data analysis employed descriptive statistics, paired t-test, independent t-test, and chi-square test.

RESULTS: Pre-test and post-test scores the experimental group's mean knowledge score increased significantly more (11.03 ± 0.65 to 17.83 ± 0.73) than the control group's (10.77 ± 0.55 to 12.55 ± 0.77) ($p<0.001$). The experimental group achieved a high knowledge level and had no adverse events, with significantly lower hospital stay rates than the control group ($p=0.015$, $p=0.019$). Surgery cancellation or postponement did not differ significantly between groups.

CONCLUSIONS: The "Application ODS" effectively increased ODS patients' knowledge and improved some clinical outcomes. Widespread adoption should be promoted to enhance healthcare quality and safety for this patient group. Further app development based on user needs and larger, long-term studies are recommended to inform appropriate policies.

KEYWORDS: One-day surgery, Anesthesia, Mobile application

I. INTRODUCTION

Mobile health applications have gained popularity as an effective tool for patient education and engagement. In the field of anesthesia, providing comprehensive preoperative information is crucial for optimizing patient preparedness, reducing anxiety, and improving clinical outcomes [1]. One-day surgery (ODS) patients, who undergo surgical procedures and are discharged on the same day, can particularly benefit from accessible and timely education [2]. However, the impact of mobile app-based education on ODS patients' knowledge and clinical outcomes remains understudied.

This quasi-experimental study aimed to investigate the effects of the "Application ODS" mobile app on educating ODS patients about anesthesia practices. The app's influence on patients' knowledge levels and clinical outcomes, such as adverse events, hospital stay rates, and surgery cancellations or postponements, was examined. The findings could inform strategies for enhancing preoperative patient education and improving the quality and safety of ODS.

II. METHODS

A. Study Design and Sample

This quasi-experimental study employed a two-group pretest-posttest design. The sample consisted of 62 ODS patients at Lampang Hospital in Thailand. Patients were randomly divided into an experimental group (n=31) and a control group (n=31). The experimental group received education through the "Application ODS" mobile app, while the control group received standard preoperative education.

B. Instruments

1) The "Application ODS" mobile app: Developed by the researcher, this Android-based app provided information on preoperative preparation, anesthesia procedures, postoperative care, and potential complications.

2) General information questionnaire: Collected demographic data and baseline characteristics.

3) Knowledge assessment form: A 20-item multiple-choice questionnaire assessing patients' knowledge of anesthesia practices, with a total score ranging from 0 to 20. The content validity index was 0.85, and the Kuder-Richardson Formula 20 reliability coefficient was 0.76.

4) Clinical outcome record form: Documented adverse events, hospital stay rates, and surgery cancellations or postponements.

C. Data Collection and Analysis

Data were collected from January to March 2023. Patients completed the general information questionnaire and knowledge assessment form before and after the intervention. Clinical outcomes were recorded throughout the perioperative period. Data analysis employed descriptive statistics, paired t-test, independent t-test, and chi-square test, with a significance level of 0.05.

III. RESULTS

A. Patients' Knowledge Scores

The experimental group's mean knowledge score increased significantly from 11.03 ± 0.65 in the pretest to 17.83 ± 0.73 in the posttest (p<0.001). The control group's score increased from 10.77 ± 0.55 to 12.55 ± 0.77 (p<0.001). The experimental group's posttest score was significantly higher than the control group's (p<0.001).

B. Clinical Outcomes

The experimental group had no reported adverse events, while the control group had two cases (6.45%). The experimental group's hospital stay rate was significantly lower than the control group's (16.13% vs. 38.71%, p=0.019). Surgery cancellation or postponement did not differ significantly between groups (3.23% vs. 9.68%, p=0.306).

IV. DISCUSSION

The "Application ODS" mobile app effectively increased ODS patients' knowledge of anesthesia practices, as demonstrated by the experimental group's significantly higher posttest scores compared to the control group. This finding aligns with previous studies highlighting the benefits of mobile app-based education in improving patients' knowledge and understanding of medical procedures [3,4].

Furthermore, the experimental group experienced better clinical outcomes, with no reported adverse events and significantly lower hospital stay rates. This suggests that the app not only enhanced patients' knowledge but also translated into improved patient outcomes. However, surgery cancellation or postponement rates did not differ significantly between groups, indicating that other factors beyond patient education may influence this outcome [5].

The study's limitations include the small sample size, single-center design, and short-term follow-up. Future research should involve larger, multi-center samples and assess long-term outcomes to provide more robust evidence. Additionally, qualitative exploration of patients' experiences and satisfaction with the app could offer valuable insights for further app development and optimization.

V. CONCLUSIONS

The "Application ODS" mobile app effectively increased ODS patients' knowledge of anesthesia practices and improved some clinical outcomes, such as reducing adverse events and hospital stay rates. These findings support the widespread adoption of mobile app-based education for ODS patients to enhance healthcare quality and safety. Further app development based on user needs and larger, long-term studies are recommended to inform appropriate policies and clinical practice guidelines.

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