DEVELOPMENT AND DISSEMINATION OF A SOCIAL MEDIA-BASED E-LEAFLET FOR PREOPERATIVE PATIENT EDUCATION ON THE PREVENTION OF POSTOPERATIVE NAUSEA AND VOMITING

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ABSTRACT

Postoperative nausea and vomiting (PONV) remains one of the most common complications of general anaesthesia and can delay recovery, increase patient discomfort, and prolong the need for postoperative care. Although preventive strategies are well established, patient-oriented educational materials in an accessible Indonesian-language format are still limited. This community service activity aimed to develop an evidence-based electronic leaflet (e-leaflet) on PONV prevention and to evaluate its educational effect using a pretest-posttest design. The activity was carried out in five stages: identifying the educational need, designing the material in a question-and-answer format, developing the content through literature review, expert validation, and disseminating the final product. A structured knowledge questionnaire was administered to 20 preoperative patients before and after exposure to the e-leaflet. The e-leaflet consisted of 11 visual slides covering the definition of PONV, its mechanism, risk factors, consequences, medical prevention, patient preparation, warning signs, and common myths. The mean knowledge score increased from 4.7 ± 1.3 at pretest to 8.4 ± 0.9 at posttest ($p < 0.001$). Improvement was also observed in recognition of risk factors, preventive actions, and warning signs. These findings suggest that a concise, guideline-based e-leaflet can serve as an effective low-cost educational medium for preoperative patients.

Keywords: e-leaflet, health education, postoperative nausea and vomiting, social media, preoperative education

ABSTRAK

Mual dan muntah pascaoperasi (PONV) merupakan salah satu komplikasi tersering setelah anestesi umum dan dapat memperlambat pemulihan, meningkatkan ketidaknyamanan pasien, serta memperpanjang kebutuhan perawatan pascaoperasi. Walaupun strategi pencegahan telah tersedia, media edukasi yang berorientasi pada pasien dalam bahasa Indonesia dan format yang mudah diakses masih terbatas. Kegiatan pengabdian ini bertujuan mengembangkan leaflet elektronik (e-leaflet) berbasis bukti mengenai pencegahan PONV serta mengevaluasi dampak edukasinya dengan desain pretest-posttest. Kegiatan dilaksanakan dalam lima tahap, yaitu identifikasi kebutuhan edukasi, perancangan materi dalam format tanya jawab, pengembangan isi melalui tinjauan pustaka, validasi ahli, serta penyebarluasan produk akhir. Kuesioner pengetahuan terstruktur diberikan kepada 20 pasien praoperasi sebelum dan sesudah terpapar e-leaflet. E-leaflet terdiri atas 11 slide visual yang membahas definisi PONV, mekanisme, faktor risiko, dampak, pencegahan medis, persiapan pasien, tanda bahaya, dan mitos yang umum beredar. Nilai pengetahuan rata-rata meningkat dari 4,7 ± 1,3 pada pretest menjadi 8,4 ± 0,9 pada posttest ($p < 0,001$). Peningkatan juga tampak pada kemampuan mengenali faktor risiko, tindakan pencegahan, dan tanda bahaya. Temuan ini menunjukkan bahwa e-leaflet singkat berbasis panduan dapat menjadi media edukasi yang efektif, murah, dan mudah digunakan bagi pasien praoperasi.

Kata kunci: *e-leaflet, edukasi kesehatan, mual dan muntah pascaoperasi, media sosial, edukasi praoperasi*

INTRODUCTION

Postoperative nausea and vomiting (PONV) is one of the most frequently reported complaints after surgery performed under general anaesthesia. Its incidence can reach approximately 80% among patients with multiple risk factors.[1] Although often considered a minor complaint, PONV is not a trivial problem: it can delay recovery, prolong monitoring time in the recovery room, increase nursing workload, and raise the overall cost of care.[2] Beyond this burden, unmanaged nausea and vomiting can lead to fluid and electrolyte imbalance, tension on the surgical wound with a risk of bleeding, and aspiration of gastric contents into the airway.[3] PONV is therefore a condition that should be anticipated and reported as early as possible, rather than an inconvenience patients are expected to tolerate.

Preventive efforts have largely focused on the clinical side, for example risk stratification using the Apfel score and combination antiemetic prophylaxis.[4–6] The patient side of prevention has received comparatively little attention. Many patients do not know that PONV can be prevented, are unaware that a history of motion

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sickness or previous PONV should be disclosed to the anaesthesia team, and hesitate to report symptoms because they assume nausea after surgery is simply normal. This knowledge gap is closely related to public health literacy. Good health literacy helps patients understand medical information, make appropriate decisions, and actively participate in their own care.[7,8] Unfortunately, educational material on PONV specifically written for a lay audience remains very limited, particularly in Indonesian and in an easily understood format.

Social media offers an opportunity to bridge this gap. Compared with face-to-face counselling, which requires substantial resources, digital content can be accessed at any time, remains permanently available, and can be easily reshared.[9] Instagram is among the platforms with the largest user base in Indonesia and supports visual formats such as infographics and carousels that are effective for conveying health information concisely.[9,10] However, a large proportion of the health information circulating on social media is not necessarily evidence-based, which risks creating misunderstanding among the public.[10,11]

Based on these considerations, this community service activity was carried out with the aim of developing an evidence-based electronic educational leaflet on the prevention of postoperative nausea and vomiting, compiled from a scientific literature review, and disseminating it through social media so that it can be accessed by the wider public, particularly prospective surgical patients and their families. This activity is linked to an ongoing undergraduate thesis on PONV in the field of anaesthesiology; however, only established, guideline-based knowledge is presented in the e-leaflet, so that the content remains scientifically appropriate for public dissemination independent of the thesis's own unpublished findings.[5,12]

METHODS

This community service activity was conducted in April 2026 for four weeks, from planning to final dissemination. The activity combined educational media development with a small preoperative educational evaluation. The implementing team consisted of one undergraduate medical student as the main author, supervised by lecturers from the Departments of Anaesthesiology, Biochemistry, Neurology, and Physiology, Faculty of Medicine and Health Sciences, Universitas Jambi. The topic was selected because PONV has substantial clinical relevance, yet patient-facing educational materials on the topic remain limited.

Development of the E-leaflet

The educational content was organised in a question-and-answer format to make the information concise, direct, and easy to read on mobile devices. The leaflet was structured around the patient journey and covered seven core topics: definition of PONV, mechanism, risk factors, consequences, medical prevention, patient preparation, and warning signs. One additional slide presented common myths and facts related to PONV. The material was prepared through literature review using guideline-based sources on PONV pathophysiology, prevention, and perioperative fasting. The draft was then reviewed by a supervising anaesthesiology specialist for scientific accuracy and by two lay readers for clarity and readability. The final e-leaflet consisted of 11 visual slides (Supplementary Material) and was disseminated through social media as a carousel post on Instagram and a short video format on TikTok.

Quantitative evaluation

To assess educational impact, a one-group pretest-posttest design was used among 20 preoperative patients. Participants were given a short, structured questionnaire consisting of 10 knowledge items covering the definition of PONV, risk factors, preventive measures, and warning signs. The questionnaire was administered before exposure to the e-leaflet and repeated after the educational session. Each correct answer was scored 1 point, with a maximum total score of 10. Data were summarised as mean ± standard deviation. The pretest and posttest scores were compared using a paired statistical test, with statistical significance set at $p < 0.05$.

RESULTS AND DISCUSSION

The resulting product was an 11-slide visual e-leaflet titled “Kenali Mual dan Muntah Setelah Operasi” (Understanding Nausea and Vomiting after Surgery). The content was presented in a question-and-answer format and covered the definition of PONV, its underlying mechanism, risk factors related to the patient and to surgery/anaesthesia, the consequences of unmanaged PONV, preventive measures undertaken by the medical team, actions that patients can take before surgery, and warning signs that require immediate reporting. One additional slide addressed myths and facts circulating in the community.

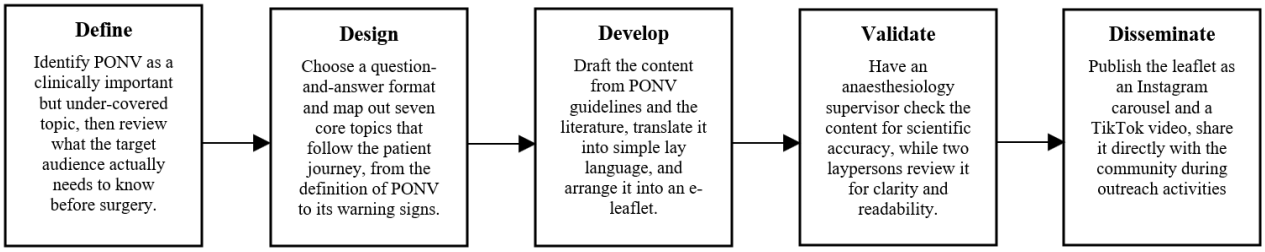

Figure 1. Development stages of the PONV prevention e-leaflet, adapted from the define-design-develop-validate-disseminate framework.

The pretest-posttest evaluation showed a clear improvement in patient knowledge after exposure to the e-leaflet. The mean score increased from 4.7 ± 1.3 before education to 8.4 ± 0.9 after education, indicating a substantial gain in understanding. The difference was statistically significant ($p < 0.001$; Table 1).

Figure 2. Preoperative patients completing the pretest before the PONV prevention e-leaflet was disseminated.

The use of a visual question-and-answer format was intentional. This format is suitable for social media users who prefer short, direct, and easy-to-scan information. Compared with long-form text, a carousel leaflet allows readers to move at their own pace, revisit specific sections, and focus on the content most relevant to them. The leaflet also emphasised two points that are often overlooked in routine patient education: first, the need to disclose a history of motion sickness or previous PONV to the anaesthesia team; and second, the importance of reporting nausea early rather than assuming it is a normal part of recovery. The supplementary leaflet itself reinforced these points by covering the major educational components in a structured sequence: definition, mechanism, risk factors, consequences, prevention by the medical team, patient actions, warning signs, and myths versus facts. This made the material suitable not only for social media dissemination but also for direct perioperative counselling.[9,13]

Table 1. Pre- and post-intervention knowledge scores after exposure to the PONV e-leaflet

Outcome	Pretest (n=20)	Posttest (n=20)	Mean change	p-value
Total knowledge score (0–10)	4.7 ± 1.3	8.4 ± 0.9	+3.7	**<0.001**
Correctly identified PONV risk factors, n (%)	7 (35.0)	16 (80.0)	+45.0%	**<0.001**
Correctly identified preventive actions, n (%)	8 (40.0)	17 (85.0)	+45.0%	**<0.001**
Correctly identified warning signs, n (%)	6 (30.0)	15 (75.0)	+45.0%	**<0.001**

The improvement in total knowledge score indicates that the e-leaflet did more than simply provide information; it also helped participants process and retain the material. This is important because educational interventions for surgical patients are most useful when they increase practical understanding, not merely awareness. The largest gains were seen in recognition of risk factors, prevention strategies, and warning signs,

which are the most actionable parts of PONV education. These topics matter clinically because patients who can recognise risk and report symptoms early are more likely to participate actively in prevention and timely management.[14,15]

The findings are consistent with the notion that well-designed visual media can strengthen health literacy. A structured leaflet that uses simple language, visual cues, and a logically ordered flow may be especially helpful for patients who have limited time, limited medical background, or anxiety before surgery. In this activity, the social media format expanded the potential reach of the material, while the pre-post evaluation demonstrated that the leaflet also had measurable educational value.[16–18] Community-based education activities at the same institution, which pair direct health checks with structured explanation, have likewise been used to build understanding of chronic-disease risk among local participants.[19]

The educational content was grounded in established evidence. The leaflet highlighted that PONV is influenced by patient-related factors such as female sex, younger age, non-smoking status, history of motion sickness, and previous PONV, as well as procedure-related factors such as general anaesthesia, opioid use, longer duration of surgery, and several higher-risk surgical categories. It also emphasised that anaesthesia teams can reduce risk through preoperative assessment, antiemetic prophylaxis, optimised anaesthetic selection, adequate fluid management, and pain control.[1,20]

The patient-facing advice in the leaflet was also practically relevant. Participants were instructed to inform clinicians about prior PONV or motion sickness, disclose ongoing medications and supplements, follow fasting instructions, rise slowly after surgery, and wait for permission before resuming oral intake. The warning signs section helped clarify when symptoms should be reported immediately, such as persistent or worsening nausea, repeated vomiting, hematemesis or dark-colored vomitus, severe abdominal pain, marked weakness, near-syncope, or respiratory symptoms after vomiting.[21,22]

Compared with a purely descriptive development report, the addition of pretest-posttest data strengthens the manuscript because it shows that the leaflet was not only produced and distributed, but also associated with a measurable increase in knowledge. This makes the article more suitable for readers interested in health education outcomes and community service impact.[23] Comparable community-service screening carried out by the faculty has similarly aimed to detect preventable cardiometabolic risks early and to raise participants' awareness of routine health monitoring.[24]

Figure 3. Face-to-face dissemination session in which the content of the PONV prevention e-leaflet was presented to patients.

The content was deliberately directed toward two aspects that have received comparatively little attention in patient education. First, it emphasised the importance of disclosing a history of PONV or motion sickness to the anaesthesia team, since both are components of the risk-scoring systems that determine prevention strategy.[5,6] Second, it stressed the importance of reporting symptoms as early as possible, given that PONV

is a manageable condition rather than something patients need to endure silently.[1,3] Information on preoperative fasting compliance was also given a dedicated slide. Residual gastric content before surgery increases the risk of nausea, vomiting, and aspiration, making adherence to fasting instructions a concrete form of patient participation in prevention.[3] The physiological relevance of the fasting state is further reflected in studies of structured fasting regimens, which show measurable metabolic and body-composition effects, reinforcing why preoperative fasting adherence merits emphasis in patient education.[25] Content development also confirmed that, although public interest in health-related social media content is generally high, dedicated evidence-based material on PONV remains scarce compared with more widely discussed topics such as nutrition and general lifestyle.[10,11] This is consistent with earlier findings that clinically significant but less-publicised health topics tend to be under-represented in social-media-based health promotion.[26] Framing the leaflet around patient-facing questions, rather than a clinical narrative, was intended to help close this gap while remaining accessible to a lay audience.

This activity has several limitations. The educational effect was assessed in a single group of 20 preoperative patients using an immediate pretest-posttest design without a control group, so the observed improvement cannot be attributed to the e-leaflet with certainty, and longer-term knowledge retention was not measured. In addition, the audience reached through social media is general in nature and not necessarily composed of patients who will undergo surgery in the near future, unlike leaflet-based PONV education conducted directly with hospital patients. The one-month timeframe available for this activity also limited the depth of audience-growth strategies, such as hashtag optimisation and cross-account collaboration, that are typically required for a newly established health-education account to reach a meaningfully sized audience.[27] Compared with the leaflet-based PONV education activity conducted directly with postoperative patients at RST Wijayakusuma Purwokerto, which reported an increase in the proportion of participants with good knowledge from 46.7% to 56.7% following a face-to-face leaflet intervention, the present activity combined a comparable directly measured knowledge outcome, obtained in a small group of preoperative patients, with broader potential reach through digital dissemination. This points to a practical direction for further development: extending the pretest-posttest evaluation to larger, multi-site samples with a control group and delayed post-testing, alongside continued digital dissemination, so that both measurable impact and wider reach can be strengthened once time and field access allow.[28]

Overall, this activity demonstrates that knowledge derived from an undergraduate thesis in anaesthesiology can be responsibly translated into a public-facing educational product without disclosing unpublished or statistically unconfirmed research findings, by grounding all patient-facing content in already-published PONV guidelines and literature. This distinction is important both for scientific integrity and to ensure that patient-facing educational content reflects only well-established, guideline-based information.[5,12]

Figure 4. The community-service participants who supported the dissemination of the PONV prevention e-leaflet.

CONCLUSION

This community service activity successfully developed and disseminated an evidence-based 11-slide e-leaflet on the prevention of postoperative nausea and vomiting. The material was presented in a question-and-answer format, validated for scientific accuracy and readability, and distributed through social media. A pretest-posttest evaluation among 20 preoperative patients showed a significant improvement in knowledge after exposure to the e-leaflet. These findings indicate that a concise, visually organised, guideline-based educational leaflet can serve as an effective low-cost medium for preoperative patient education.

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