

# Development and Evaluation of an Aesthetic Nursing Communication Program Using Multimedia Application for Older Patients with Intubation

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## Abstract

**Objectives:** This study aimed to develop and evaluate the feasibility and usefulness of the Aesthetic Nursing Communication Program Using the Multimedia Application (ANCP-MA), named “Older Tube-Talk,” for Older Patients with Intubation (OPI). **Material and Methods:** The study utilized the Theory of Aesthetic Nursing Practice and the concept of communication for older adults. Research was conducted in two intensive care units using a Research and Development method with three phases: Draft Prototype, Prototype, and Testing Prototype. The prototype featured functions for both nurses and OPI. Thirty-five nurses and thirty OPI participated in testing the prototype’s feasibility and usefulness. Data were analyzed using descriptive statistics and the Wilcoxon Signed Rank Test. **Results:** The feasibility scores rated by nurses ( $M = 4.0$ ,  $SD = 0.56$ ) and OPI ( $M = 4.1$ ,  $SD = 0.68$ ) were high. OPI communication needs scores significantly improved after participating ( $Mdn = 25$ ,  $IQR = 5$ ) compared to before ( $Mdn = 18.5$ ,  $IQR = 3$ ) ( $Z = -4.79$ ,  $p < 0.000$ ). Communication satisfaction scores for OPI ( $Mdn = 21$ ,  $IQR = 3$ ) and nurses ( $Mdn = 22$ ,  $IQR = 4$ ) were significantly higher after participation compared to before (OPI:  $Mdn = 16$ ,  $IQR = 4$ ; Nurses:  $Mdn = 18$ ,  $IQR = 5$ ) ( $Z = -4.65$ ,  $p < 0.000$ ;  $Z = -4.39$ ,  $p < 0.000$ ). **Conclusion:** The ANCP-MA prototype is feasible and effective for enhancing communication between nurses and OPI, supporting its implementation in clinical practice.

## Keywords

Aesthetic, Multimedia Application, Nursing Communication, Intubated

## 1. Introduction

Patients with respiratory failure receive an endotracheal tube to maintain their airway, resulting in ineffective communication [1]-[4]. More than 60 percent of patients did not meet their communication needs during intubation [5]. This problem leads to increasing psycho-emotional distress such as anxiety, depression, frustration, decreased self-esteem, fear and anger, panic, loss of control, posttraumatic stress disorder, and delirium [5]-[6]. For nurses, they experience negative emotions as well if they are unable to relieve intubated patients' suffering due to ineffective communication [7]. Consequently, communication failure may lead to dissatisfaction for both patients and nurses, resulting in unmet care and unsuccessful treatment [5]-[6]. On the other hand, effective communication between nurses and patients may increase their satisfaction and significantly influence patient outcomes [8].

Several communication methods and strategies have been developed to enhance communication between intubated patients and nurses. They were called Augmentative and Alternative Communication (AAC). In previous studies, two types of AAC, low-technology and high-technology AAC, were mostly mentioned. Low-technology or essential tools include pen and paper to write freely, communication boards that show icons and pictures representing a patient's basic needs, and alphabet and symbol cards or charts [9]-[11]. Conversely, high-technology tools may include applications that are accessed through handheld devices such as iPads, tablets, and mobile phones, which allow patients to touch a word or picture icon to generate prerecorded messages [12]-[13].

Research has shown that 60 to 70 percent of all intubated patients with mechanical ventilation were patients aged 65 years old or above [2]. Nonetheless, there are some barriers that could lead to failure in using high-tech AAC for older patients. According to Potts [14], OPI made finger errors relating to touch pressure, location, or technique on the AAC, which is a tablet, for around 59 percent of the test messages, while there were only 14 percent of finger errors in the younger intubated patients. In addition, the qualitative analysis of this study showed that patients shared the questions they most wanted but were unable to do so in their tool to communicate them during intubation [14].

Some studies developed methods to improve communication between nurses and patients with intubation in Thailand [13]-[15]. One study was for pediatric patients [13], and another study was for adults [15]; however, the multimedia they used did not support the communication abilities of the older patients (small text fonts, tiny graphics). These studies did not mention the nurses' communication skills with OPI [13]-[15].

Nevertheless, a mere communication tool by itself is not enough to enhance

effective communication between nurses and OPI. Nurses' communication strategies are also necessary [8]. Communication in nursing is not only the ability to transfer words between nurses and patients, but it is also an essential part of good nursing practice and for developing a trusting relationship that will greatly improve care [16]. Also, communication is a crucial tool in humanistic care that can either have a positive effect, leading to longevity and good health, or result in poor health and death [17]. Thus, nurses' communication skills are required to meet the persons' needs and maintain their dignity [18]-[19]. As a result, nurses' verbal and nonverbal communication behaviors with older patients and how messages may be misinterpreted must be considered [20]. Seeing the individual, being respectful, and showing empathy and compassion are important elements in nursing communication with older patients [20]-[21].

Aesthetic Nursing Practice (AesNURP) theory [22], a middle-range theory developed by Waraporn Kongsuwan in the year 2020, provides significant tenets for nurses in aesthetic nursing communication. The theory presents the idea that nurses and persons being nursed are engaged continuously in nursing communication to provide meaningful care. This theory includes five assumptions [22]: 1) Persons are caring by virtue of their humanness [23], 2) Ideal of wholeness as a perspective of oneness [24], 3) Persons co-create aesthetic experiences, 4) Persons mutually interact with the environment, and 5) Aesthetics in nursing is within an aesthetic environment. In addition, AesNURP values on Practice Processes of Aesthetics in Nursing (*PraPan*), which consist of the three processes—encountering, co-creating caring relationships, and meaningful engaging within the aesthetic environment. These processes guide nurses on how to interact and communicate with persons being nursed.

Hence, this study aimed to develop an innovation that interweaves aesthetic nursing practice and technology to enhance communication between nurses and older patients.

## 2. Objectives of the Study

To develop an ANCP-MA for OPI; and

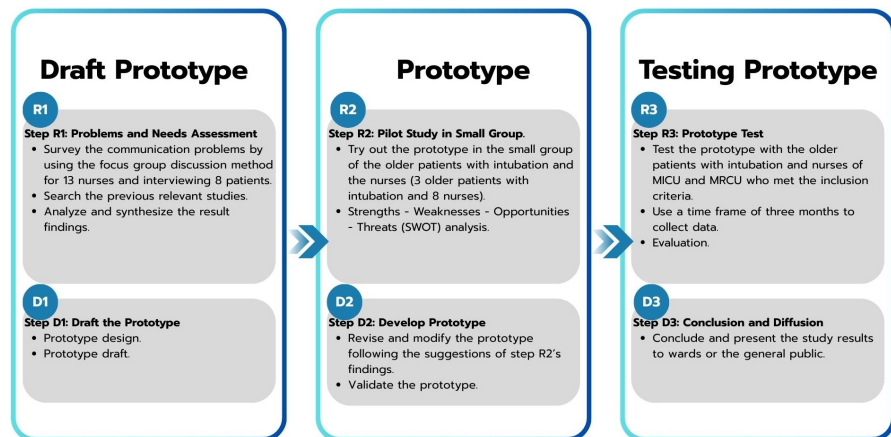
To evaluate the feasibility and usefulness of an ANCP-MA for OPI.

## 3. Design and Methods

### 3.1. Design

Research and development (R&D) is used in this study. R&D is the process of obtaining new knowledge that might be used to create new technology, products, services, or systems [25]. R&D comprises three phases and six steps [26]. The first phase, *Draft Prototype* consists of two steps: 1) Problem and Need Assessment and Concept Paper, and 2) Prototype Design and Prototype Draft. The second phase, *Prototype*, is composed of two steps: 1) Pilot Study in the Small Group, and 2) Develop Prototype. The final phase, *Testing Prototype*, includes two steps: 1) Testing the Prototype in the Large Group and 2) Conclusion and Diffusion, as

presented in **Figure 1**.



**Figure 1.** Phases and steps of development of an Aesthetic Nursing Communication Program using the Multimedia-Assisted Communication Application for OPI.

Aesthetic Nursing Practice (AesNURP) theory [22] was used as a framework to develop an Aesthetic Nursing Communication Program. This theory guides nurses in interacting and communicating with patients in nursing situations through three Practice Processes of Aesthetics in Nursing Practice (*PraPan*)—encountering, co-creating caring relationships, and meaningful engaging.

The concepts of communication for older patients were considered in designing a multimedia application as a tool to assist communication. The concepts of graphics and color [27], text and font [28]-[29], and sound [30] for older patients were applied appropriately. For example, the size of red and yellow [27] letters should be large; the body width of the font should be 60% of the body height (baseline to mean-line), and the font line should be 10% of the distance from the letter's baseline to mean-line [29].

### 3.2. Setting and Sample

The settings of this study were the Medical Intensive Care Unit (MICU) and the Medical Respiratory Care Unit (MRCU) of a university hospital in Southern Thailand. Four groups participated: 1) Development Team, 2) Expert Team, 3) Registered nurses (RNs), and 4) OPI. Three experts including a nursing professor, a physician in critical care, and a head nurse in critical care were invited to validate the ANCP-MA for OPI and all the measurement tools. One expert, a computer professor, was invited to comment and make suggestions regarding the application development. Consistent with the R&D design, the prototype testing phase aimed to evaluate feasibility and usability rather than statistical effectiveness [31]. Accordingly, 58 RNs and 41 older patients in MICU and MRCU participated in this study. Thirteen nurses and eight older patients who experienced intubation participated in the draft prototype phase, three OPI and eight nurses participated in the prototype phase, and 35 nurses and 30 OPI were recruited to test the feasibility and usefulness of the prototype in the testing pro-

totype phase. These numbers were sufficient to identify major feasibility and usability issues.

### 3.3. Data Collection Tools and Methods

Five tools were used in this study:

1) Nurse's Feasibility of Using ANCP-MA for OPI Questionnaire

Adopted from a previous study, this tool evaluates four aspects: ease of use, suitability with resources, readiness and cooperation of relevant parties, and benefits for prototype users. It uses a five-point feasibility scale, with higher scores indicating higher feasibility.

2) Patient's Feasibility of Using ANCP-MA for OPI Questionnaire

Developed by researchers, this tool includes five items based on literature and assesses ease of use, equipment suitability, usefulness, and readiness. It uses a five-point feasibility scale, with higher scores reflecting higher feasibility.

3) Nurse's Satisfaction on Communication Questionnaire

This tool measures nurses' communication satisfaction before and after implementing ANCP-MA for OPI. Developed from literature, it evaluates satisfaction with communication components: messenger role, receiver role, message/channel, and feedback. It uses a five-point satisfaction scale, with higher scores indicating greater satisfaction.

4) Patient's Satisfaction on Communication Questionnaire

This tool assesses OPI satisfaction with communication before and after using ANCP-MA for OPI. Based on literature, it evaluates satisfaction with the messenger, receiver, message/channel, and feedback. It uses a five-point satisfaction scale, where higher scores indicate greater satisfaction.

5) Patients' Perceived Communication Need Questionnaire

This tool measures OPI perceptions of their ability to communicate needs across four dimensions: physical, psychosocial/spiritual, pain and emergencies, and decision-making. The final item measures overall communication competence. It uses a five-point scale, with higher scores reflecting better perceived abilities.

### 3.4. Validity and Reliability

The interview form and data-collection instruments were reviewed by three experts and revised based on their suggestions. The S-CVI/Ave values for the instruments were as follows: Nurse's Feasibility of Using ANCP-MA for OPI Questionnaire (0.97), OPI Feasibility Questionnaire (0.93), Nurse's Satisfaction Questionnaire (0.87), Patients' Satisfaction Questionnaire (0.87), and Patients' Perceived Communication Needs Questionnaire (0.95).

Reliability was tested with 20 nurses and 20 OPI from three wards: the Cardiac Care Unit (CCU), the Surgical Intensive Care Unit (SICU), and the Cardio-Vascular and Thoracic Intensive Care Unit (ICU-CVT). These wards shared similar characteristics with the study population. The Cronbach's alpha coefficients were

0.88 for the Nurse's Satisfaction Questionnaire, 0.93 for the Patients' Satisfaction Questionnaire, and 0.90 for the Patients' Perceived Communication Needs Questionnaire. During the testing phase, the reliability of feasibility measurement tools was evaluated with 35 nurses and 30 OPI. The Cronbach's alpha coefficients were 0.92 for the Nurse's Feasibility Questionnaire and 0.93 for the OPI Feasibility Questionnaire.

### **3.5. Data Analysis**

The qualitative content analysis method [32] was used to analyze data on problems and needs in communication. Descriptive statistics were used to analyze the demographic data and level of feasibility. The Wilcoxon Signed Rank Test was used for analyzing the differential data between pre-and post-test of nurses and OPI communication satisfaction and OPI's perceived communication needs, because all the data revealed an abnormal distribution.

### **3.6. Ethical and Institutional Approval**

The study was approved by the Institution Review Board, Faculty of Medicine, Prince of Songkla University (number REC.64-280-19-9). All participants signed the informed consent forms. The researcher trained the nurses in assessing the patient's readiness before the intervention, including hemodynamics, respiratory signs and symptoms, and clear secretion. In addition, because the intervention had to be done five times for each patient, it might have been a little disturbing in terms of taking up the participant's time. Hence, the researcher limited the time to maximum ten minutes per instance of using the prototype.

## **4. Results**

### **4.1. The ANCP-MA for OPI**

The ANCP-MA for OPI was developed in terms of a web application "Older Tube-Talk" that operates on a tablet with a 10.1-inch Full High Definition (Full HD) screen as presented in **Figure 2**. The tablet weighs 450 grams. This app has two main functions: Aesthetic Nursing Communication Program (ANCP) and the Multimedia-Assisted Communication (MA) for OPI.

#### **4.1.1. Aesthetic Nursing Communication Program**

The Aesthetic Nursing Communication Program (ANCP) provided nurses with structured communication guidance for interacting with intubated older patients. The Aesthetic Nursing Practice in Communication between Nurses and OPI, as the main nursing communication instruction menu, was grounded in the AesNURP [22] theory, as presented in **Table 1**. In addition, the ANCP included brief educational videos on key communication skills and multimedia resources to support explanations and interactions with OPI. Together, these elements were designed to enhance nurses' awareness, confidence, and responsiveness to patients' communication needs. The ANCP are shown in **Figure 2**.

**Table 1.** An aesthetic nursing communication instruction guided by AesNURP Theory.

AesNURP theory (Kongsuwan, 2020)	Applying to ANCP	Reminding Questions for Nurses
<b>Encountering</b> “knowing self and others as caring person encompassing aesthetics, personal, empirics, ethics, technological knowing”	Knowing the intubated older as a whole person  Knowing the communication abilities and limitations of the older person with intubation  Knowing your communication abilities enhances effective communication with older patients with intubation	<ol style="list-style-type: none"> <li>1. Do I know the patient as a whole person, not just their physical illnesses?</li> <li>2. Do I know the reasons that may be linked to the communication needs of the patient?</li> <li>3. Do I have a reliable source related to the communication needs of the patient?</li> <li>4. Do I need additional information related to the communication needs of the patient from their relatives?</li> <li>5. Is the older patient with intubation awake and conscious enough to communicate with me?</li> <li>6. Which of their communication methods is the best?</li> <li>7. Does the older patient with intubation see and hear clearly?</li> <li>8. Can the older patient with intubation still write?</li> <li>9. Am I ready to communicate with my patient? Don't forget that my emotions, facial expressions, gestures, and tone of voice always affect older patients with intubation.</li> <li>10. What can I do to understand the patient?</li> <li>11. What communication methods or devices can I use with older patients with intubation?</li> </ol>
<b>Co-creating Caring Relationship</b> “Co-creating is a synchronous interaction between nurse-client by mutual knowing, interpreting, understanding/ appreciating within the aesthetic environment”	and understand what they express without judgment  Co-creating and designing the communication engagement together  Using the appropriate communication aids	<ol style="list-style-type: none"> <li>1. Do I open my mind to understand every communication expression of the older patient with intubation without judgment?</li> <li>2. Am I trying to see the problems from the patients' point of view?</li> <li>3. Do I really intend to communicate with older patients with intubation?</li> <li>4. Does the older patient with intubation need to receive information about being an intubated person?</li> <li>5. Have I provided enough information about the alternative communication during intubation to the older patients with intubation?</li> <li>6. Is the older patient with intubation involved in selecting the communication method?</li> <li>7. Does the older patient with intubation need communication aids such as eyeglasses and hearing aids?</li> <li>8. What is the meaning of their gesture?</li> <li>9. Can I use the pictures or text to help in communication with them?</li> <li>10. Can they write?</li> <li>11. Can they use the communication tablet?</li> </ol>
<b>Meaningful Engaging</b> “mutual participation in caring between nurse-client relationships, expressing caring through aesthetic processes within the aesthetic environments”	Use the aesthetic communication techniques that are suitable for older persons with intubation	<ol style="list-style-type: none"> <li>1. Do I apply the appropriate communication skills to have a meaningful communication with the older patients with intubation by doing the following? <ul style="list-style-type: none"> <li>- Show a friendly expression and make eye contact while communicating.</li> <li>- Call their names or use appropriate pronouns to call the patients</li> <li>- Speak loudly but without shouting, be clear and concise, and have a single point of content in each sentence</li> <li>- Use calm and friendly tones of voice and avoid using high-pitched tones</li> <li>- Use material that is appropriate for the older person's abilities to see and hear</li> <li>- Induce a calm attitude by using media to teach about necessary information about endotracheal tubes.</li> <li>- Allow time for older patients to communicate and being an attentive listener.</li> <li>- Use a soft, gentle touch.</li> </ul> </li> </ol>

**Continued**

<b>Meaningful Engaging</b> “mutual participation in caring between nurse-client relationships, expressing caring through aesthetic processes within the aesthetic environments”	Reflecting on the value of communication events	2. Do I understand what the patient wants to communicate? 3. Does the older patient with intubation receive the nursing care s/he needs? 4. How does the patient reflect the appreciation of this communication? How do I feel my self-worth when I can understand and help them exactly?
	Forwarding information for proper communication	5. Do I record and forward the information in the communication that is important for continuous nursing care to the other nurses? 6. Can I share the aesthetics of communication between nurses and older patients with intubation with other nurses as a source of knowledge for further communication?

#### 4.1.2. Multimedia—Assisted Communication Application

This function was designed to improve communication for OPI, featuring five submenus with three types of hot buttons based on the type of need. It also included two additional sections for pain expression and a typing menu for needs not covered by the app. Each hot button function contained multiple items: 28 for physical needs, 24 for psychosocial and spiritual needs, and 4 for acute needs. All items, except the four acute needs, featured pictures and text. A loud sound was activated when a button was pressed. The patient could select the items by touching the screen. Each page displayed one item with large pictures and text to accommodate visual ability. The colors used were yellow, orange, and red with strong contrast, in line with the design principles for OPI. The four acute need items: saliva suction, secretion suction, difficulty breathing, and the need to remove the endotracheal tube: had the same features as the other hot buttons. However, these items appeared together on the first screen of the menu. The pain menu allowed OPI to express pain by touching parts of the human body (front and back view). When the pain area was touched, the color changed, and the app announced the name of the body part, such as “stomachache” for the stomach. The app also included a numeric pain scale and various pain types. The details of the multimedia-assisted communication program are shown in **Figure 2**.

#### 4.2. Evaluation of an Aesthetic Nursing Communication Program Using the Multimedia

##### Application for Older Patients with Intubation

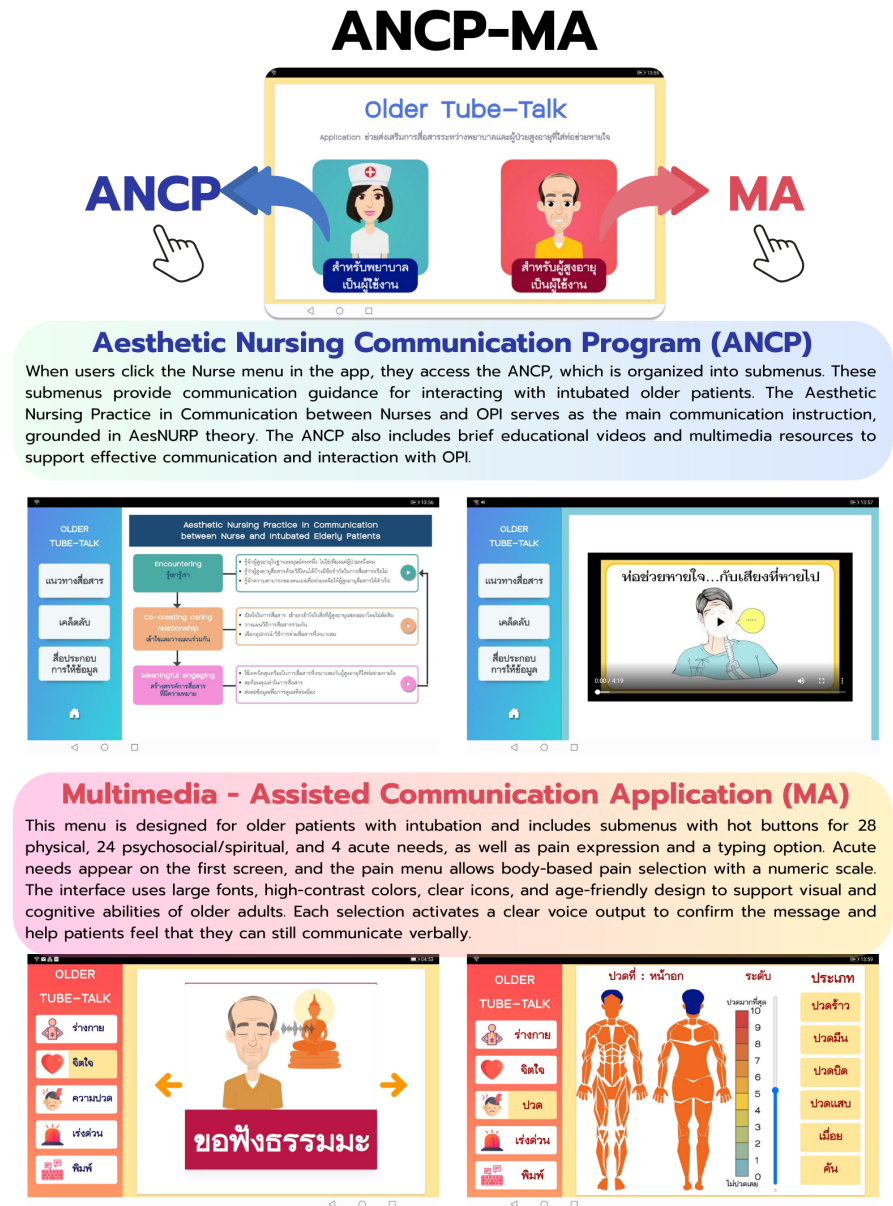
Thirty-five nurses and thirty OPI were recruited to test the feasibility and usefulness of the prototype.

##### Feasibility

The average feasibility scores by nurses and OPI showed a high feasibility level ( $M = 4.0$ ,  $SD = 0.56$ , and  $M = 4.1$ ,  $SD = 0.68$ , respectively). Also, the mean scores for each feasibility topic showed a high feasibility level.

##### Usefulness

All usefulness scores consisting of the OPI’s perceived communication needs, the OPI’s communication satisfaction, and nurses’ communication satisfaction after participating in the testing prototype were significantly higher than those before participating in this program, as presented in **Table 2**.



**Figure 2.** The ANCP-MA for OPI.

**Table 2.** Comparison of Median (Mdn) and Interquartile Range (IQR) of all Pre- and Post-intervention of usefulness scores among OPI and Nurses.

Variables	Pre-Intervention		Post-Intervention		Statistic	
	Mdn	IQR	Mdn	IQR	Test Z	p-value
1. Older patients’ perceived communication needs	18.5	3	25	5	-4.790	0.000**

**Continued**

2. Older patients' communication satisfaction	16	4	21	3	-4.650	0.000**
3. Nurses' communication satisfaction	18	5	22	4	-4.390	0.000**

Note: Mdn = Median, IQR = Interquartile Range. \*\*  $p < 0.01$ .

The OPI's perceived communication needs score after participating in the testing prototype phase (Mdn = 25, IQR = 5) was significantly higher than before (Mdn = 18.5, IQR = 3) participating in this program ( $Z = -4.79$ ,  $p < 0.000$ ). The score of the OPI's communication satisfaction after participating in the testing prototype phase (Mdn = 21, IQR = 3) was significantly higher than before (Mdn = 16, IQR = 4) participating in this program ( $Z = -4.65$ ,  $p < 0.000$ ). The score of nurses' communication satisfaction after participating in the testing prototype phase (Mdn = 22, IQR = 4) was significantly higher than before (Mdn = 18, IQR = 5) participating in this program ( $Z = -4.39$ ,  $p < 0.000$ ).

## 5. Discussion

The Older Tube-Talk application is a new communication tool designed to improve communication between nurses and OPI. It combines two key components: a nursing program for nurses and a multimedia-assisted communication app for OPI. This study's framework differs from others [33] [34]. One study [33] developed a Clinical Nursing Practice Guideline for communication with intubated patients, using the Australian National Health and Medical Research Council framework. Another study [34] focused on a communication assistance app based on human needs, using the Technology Acceptance Model (TAM). In contrast, this study used the R&D method [23], which is practical and flexible for integrating communication strategies and devices into application development. This approach allows for easy modification to suit the study's context and facilitates the creation of the Older Tube-Talk app for the target population, generating new knowledge about nurse-OPI communication.

Previous studies related to enhancing effective communication among intubated patients have focused on communication device development [8] [33] [34] whereas this current study applied AesNURP theory [22] as a theory-based process in guiding the development of communication nursing program. In addition, various multimedia technologies were incorporated to enhance the communication abilities of OPI.

The feasibility evaluated by nurses in each topic showed a high feasibility level. The highest mean score was presented in two topics: *Implementing this program-based communication guideline benefits older patients with intubation* ( $M = 4.2$ ,  $SD = 0.66$ ) and topic *Using the multimedia communication tablet device makes it easier to understand the needs of older patients with intubation* ( $M = 4.2$ ,  $SD = 0.69$ ). According to Makmee32, their nurses' feasibility results on using the com-

munication guidelines combined with a communication chart also showed good results ( $M = 4.12$ ,  $SD = 0.50$ ). However, some topics of their questionnaire related to effectivity measurement, such as frustration decreasing, which obtained outstandingly high scores ( $M = 4.69$ ,  $SD = 0.60$ ). In contrast, only feasibility measurement (not frustration level) was evaluated in this study for the ANCP-MA for OPI. Also, 16 nurses evaluated the feasibility result of Makmee [33], whereas 35 nurses were tested in this study. The difference in the number of participants may have affected the mean score analysis.

For OPI's evaluation, it was found that the highest mean score was presented in the topic, *I can use the Multimedia-Assisted Communication Tablet without interruption* ( $M = 4.2$ ,  $SD = 0.62$ ). It can be interpreted that OPI can use this Multimedia-Assisted Communication Tablet smoothly. This is because this prototype was developed based on the older patients' communication abilities. In addition, because this study enhanced aesthetic communication in nursing, the problem of tool access, such as the device being in the room but beyond the participants' reach, did not occur in this study since the nurses had to know when their patients had communication needs. Although tool access was not an issue in this study because nurses were trained to recognize patients' communication needs, real-world clinical environments often involve high nurse-to-patient ratios and competing clinical priorities. The program may help overcome these barriers by embedding brief, routine communication checks into nursing workflows, prioritizing urgent needs, and promoting team-based support so that communication is not dependent on a single nurse. These strategies may increase the likelihood that the ANCP-MA can be used consistently even in busy ICU settings.

The evaluated perceived communication needs of OPI are quite different from the evaluation part of similar previous studies that focused on the patient's perceived communication frustration [11]. Nevertheless, the results of OPI's perceived communication needs can show the usefulness impact of the prototype. The most significant change was presented in the topic *You feel able to communicate your urgent needs to the nurse to keep you safe*, where the mean score went from 3.1 ( $SD = 0.57$ ) from the pre-test to a mean score of 4.5 ( $SD = 0.51$ ) in the post-test. A patient commented that the prototype made them feel safer because they could communicate their acute needs to the nurses easily and quickly, so their worries decreased. It conforms to the previous studies [4] [14] [35] that showed that enhancing effective communication abilities for OPI, particularly in dangerous or harmful situations, can make the patients feel safe from being voiceless, especially in older patients [4] [14].

Previous studies [9] [11] [12] suggested that communication satisfaction is a useful measure of the impact of communication devices and strategy development. In this study, communication satisfaction was used to assess the prototype's effectiveness. OPI's communication satisfaction score significantly improved after participating in the study compared to before. This increase was higher than in Makmee's study [33], though both studies reported a "very satisfied" level. In this

study, the largest mean score difference occurred in communication between nurses and OPI, helping mutual understanding. In contrast, Makmee's study [33] showed the largest difference in communication tools.

Although, in the part of the nurses' communication satisfaction, the mean score of overall nurses' communication satisfaction in the pre-test already showed a very high satisfaction level, the Wilcoxon Signed Rank Test revealed that the median score of nurses' communication satisfaction after participating in the testing prototype phase (Mdn = 22, IQR = 4) were significantly higher than those before (Mdn = 18, IQR = 5) participating in this program ( $Z = -4.39$ ,  $p < 0.000$ ). The biggest difference between the mean score of the pre-test ( $M=3.6$ ,  $SD = 0.60$ ) and the post-test ( $M = 4.40$ ,  $SD = 0.60$ ) was shown in the topic, *you are satisfied that you can understand what the older patients with intubation want to communicate with you*. Hence, it showed that the nurses' communication satisfaction increased following their improved understanding of their patients. As a result, using the study's prototype impacted nurses' and patients with intubation's communication satisfaction levels.

The Multimedia Assisted Communication Tablet for Older Patients with Intubation improved their communication abilities and satisfaction as communication senders. On the other hand, nurses had more satisfaction in communication when they better understood the needs of OPI. This may be because the study provided the Nursing Communication Program that urged them to have a positive attitude towards communicating and understanding patients as a whole person following the AesNURP process that was applied in the communication strategy in this study. Also, the tablet application may be one of the important factors to help the nurses easily understand the patient's needs because it is appropriate for older patients' communication abilities and covers most of the specific needs of OPI.

## 6. Limitations

The prototype uses the Thai language, which patients with other languages may not be able to understand. However, it provides multimedia elements that can help patients who do not understand the Thai language recognize the needed items. Although all elements of the application were designed based on the communication abilities and limitations of older patients, some patients with severe sensory loss, such as seeing and hearing problems, needed additional communication devices like eyeglasses and hearing devices.

## 7. Implications for Practice

Aesthetic Nursing Communication Program Using the Multimedia-Assisted Communication Application for Older Patients with Intubation was feasible to use for nurses and OPI. It was developed by using nursing theory combined with high technology that is appropriate to use in the technology era to enhance the success and satisfaction between nurses and OPI. For nursing education, this study can be used as a resource of nursing knowledge in nursing innovation development processes.

This study provided the first prototype of an ANCP-MA for OPI. Further study is recommended to test its effectiveness related to health outcomes such as anxiety, emotional distress, and pain or comfort. In addition, further studies should examine the effectiveness of decreasing the risk of common accidents due to ineffective communication between nurses and older patients with intubation, such as unexpected extubation and falling.

Beyond evaluating health outcomes, future research should also explore the long-term adoption and scalability of the ANCP-MA across different ICU settings and cultural contexts. Examining how the program is sustained over time, adapted to local resources, and integrated into routine clinical workflows will provide important insights into its real-world applicability and sustainability.

## 8. Conclusion

The development of the ANCP-MA for OPI was guided by Aesthetic Nursing Practice Theory. The R&D method was used as framework of the study. The usage of the study's prototype is highly feasible. It is useful for enhancing communication between nurses and OPI, increasing older patients' perceived communication needs, and nurses' and patients' communication satisfaction.

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## Author Contributions

Criteria	Author Initials
Made substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data;	WK; SN
Involved in drafting the manuscript or revising it critically for important intellectual content;	WK; SN
Given final approval of the version to be published, each author has participated sufficiently in the work to take public responsibility for appropriate portions of the content;	WK; SN
Agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.	WK; SN

## Ethical Approval

This study was approved by the Institution Review Board, Faculty of Medicine, Prince of Songkla University (number REC.64-280-19-9).

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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