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ORIGINAL ARTICLE

# Outcomes of Telemedicine with Usual Care Versus Usual Care in Palliative Cancer Patients at Ramathibodi Hospital: A Randomized Controlled Trial

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## ABSTRACT

**Background:** The Coronavirus pandemic saw changes in palliative care that included increased telemedicine usage. Data regarding the effectiveness of telemedicine remains inconclusive. This study's primary purpose was to use the Palliative Care Outcome Scale (POS) to compare quality-of-life outcomes for two groups of palliative cancer patients: one receiving telemedicine alongside conventional care and another receiving only standard care. The secondary objective compared the number of emergency department visits made by both groups of patients.

**Methods:** Fifty-eight cancer patients at Ramathibodi Hospital in Bangkok, Thailand, took part in a study between January 2021 and January 2022. They were randomly assigned to the two test groups. In the second, fourth, and sixth weeks of the study, researchers used the Thai language POS to evaluate quality-of-life outcomes and analyzed resultant data with a Mann-Whitney U test.

**Results:** Results showed the telemedicine and standard care group received median POS scores of 8 (6,11), 6 (4,10.5), and 6.5 (2.5,13) at the end of each period while the other group received outcome scores of 9 (5,12), 8.5 (5.5,15.5), and 7 (5,11) for the same periods. Analysis showed no significant differences between these outcomes nor a significant difference in Emergency Department visits made by the members of the two groups.

**Conclusion:** The Quality of Life and the number of Emergency Department visits made by patients who received telemedicine (combined with usual care) did not differ from patients who received only conventional care. Further studies should be conducted in other hospital contexts to verify these results.

**Keywords:** palliative care, telemedicine, Palliative care Outcome Scale, randomized controlled trial

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นิพนธ์ต้นฉบับ

# ผลลัพธ์ของการใช้ระบบแพทย์ทางไกลควบคู่กับการดูแลปกติเปรียบเทียบกับการดูแลแบบปกติในผู้ป่วยมะเร็งที่ได้รับการดูแลแบบประคับประคอง: การทดลองสุ่มแบบมีกลุ่มควบคุม

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**บทคัดย่อ**

**ที่มา:** จากสถานการณ์โรคติดเชื้อไวรัสโคโรนา 2019 การแพทย์ทางไกลถูกนำมาใช้มากขึ้นในการดูแลผู้ป่วยประคับประคอง แม้ว่าผลการศึกษาเรื่องประสิทธิภาพยังไม่ชัดเจน งานวิจัยนี้มีจุดประสงค์หลักเพื่อเปรียบเทียบผลลัพธ์การดูแลของผู้ป่วยมะเร็งระยะประคับประคองระหว่างกลุ่มที่ได้รับการดูแลผ่านระบบแพทย์ทางไกลควบคู่กับการดูแลปกติเทียบกับกลุ่มปกติ วัตถุประสงค์รองคือจำนวนครั้งที่มาแผนกฉุกเฉินของทั้งสองกลุ่ม

**วัสดุและวิธีการ:** แบบ Randomized controlled trial จากผู้ป่วยมะเร็งที่ได้รับการรักษาแบบประคับประคองจำนวน 58 รายในโรงพยาบาลรามาธิบดีระหว่างเดือน มกราคม 2564 ถึงมกราคม 2565 ได้รับการสุ่มเพื่อเข้ากลุ่มดูแลผ่านระบบแพทย์ทางไกลควบคู่กับการดูแลปกติจำนวน 29 รายและกลุ่มที่ได้รับการดูแลปกติจำนวน 29 ราย ทั้งสองกลุ่มจะได้รับการประเมินผลลัพธ์การดูแลด้วย Palliative care Outcome Scale ฉบับภาษาไทยที่อาทิตย์ที่ 2 4 และ 6 หลังเข้าร่วมวิจัย เปรียบเทียบผลลัพธ์โดยใช้ Mann-Whiney U test

**ผลการศึกษา:** ค่ามัธยฐานของคะแนน Palliative care Outcome Scale ที่อาทิตย์ที่ 2 4 และ 6 ของกลุ่มที่ได้รับการดูแลผ่านระบบแพทย์ทางไกลควบคู่กับการดูแลปกติคิดเป็น 8 (6,11) คะแนน 6 (4,10.5) คะแนน และ 6.5 (2.5,13) คะแนนตามลำดับเทียบกับกลุ่มที่ได้รับการดูแลปกติคิดเป็น 9 (5,12) คะแนน 8.5 (5.5,15.5) คะแนน และ 7 (5,11) คะแนนตามลำดับ ซึ่งไม่พบความแตกต่างอย่างมีนัยสำคัญทางสถิติเช่นเดียวกับจำนวนครั้งที่ผู้ป่วยทั้งสองกลุ่มมาแผนกฉุกเฉิน

**สรุป:** คุณภาพชีวิตและการมาแผนกฉุกเฉินระหว่างผู้ป่วยที่ได้รับการดูแลผ่านระบบแพทย์ทางไกลควบคู่กับการดูแลปกติไม่แตกต่างกับการดูแลปกติ ในอนาคตควรมีการศึกษาเพิ่มเติมในบริบทโรงพยาบาลอื่น

**คำสำคัญ:** การดูแลแบบประคับประคอง การแพทย์ทางไกล ผลลัพธ์การดูแล Palliative care Outcome Scale, randomized controlled trial

## Introduction

In 2019, many countries introduced social distancing and telemedicine measures to contain the COVID-19 outbreak. The adoption of telemedicine enabled health professionals to screen patients suspected of being infected with the virus and reduced unnecessary hospitalizations. It also allowed patients with chronic diseases, the elderly, and other at-risk groups to receive treatment without exposure to the virus.[1] Telemedicine proved especially useful in treating the terminally ill, including cancer patients.[2-4]

According to a World Health Organization report, cancer was the leading cause of death worldwide in 2018. The report suggested that of the 40 million terminally ill patients in need of palliative care globally, 34% were cancer patients. Statistics provided in 2017 by the National Cancer Institute of Thailand suggested that 3,441 new Thai cancer patients had received medical services, and of these, 1,076 had stage IV cancer.[5] As a result of such figures, Thai health authorities established a range of palliative care guidelines for the Thai National Health System.[6]

Palliative care helps improve the quality of life of cancer patients in the terminal stages of the disease and provides support for their families. It aims to alleviate suffering with holistic care that includes physical, mental, social, and spiritual measures.[7] Many studies have found that, as doctors have more convenient access to patients, telemedicine improves the quality of life of the terminally ill and their caregivers. The approach also helps reduce costs by reducing the need for patients to visit a hospital.[9] It also helps reduce the number of Emergency Room visits patients need to make. Most importantly, it enables doctors and nurses to alleviate pain and suffering more effectively.[2]

However, although many studies indicate the positive impacts of adopting telemedicine, empirical results remain inconclusive. Reasons include a lack of robust evaluation and traditionally small research sample sizes.[9] Some studies that included frequent patient follow-up showed increasingly worse patient distress scores.[10] In Thailand, there have been no studies addressing the efficacy of telemedicine in patients receiving palliative care.

The primary objective of this study was to compare the quality of life of palliative cancer patients receiving telemedicine (combined with the usual care approaches) and those who only received standard care. Its secondary objective was to evaluate the effect of teleconsultations on emergency department visits.

## Methods

### Study design

We conducted a two-armed, randomized control trial. The Committee on Human Rights Related to Research Involving Human Subjects, Faculty of Medicine, Ramathibodi Hospital, Mahidol University (MURA 2021/33) approved the study protocol and all participants provided written informed consent.

### Participants

*Setting and location*

The sample population was palliative cancer patients who received treatment at Ramathibodi Hospital, in Bangkok, Thailand. The study recruited patients from the hospital's inpatient departments and outpatient clinics, especially those of the Departments of Family Medicine and Oncology. The inclusion period for this trial was 12 months (January 2021-January 2022).

*Inclusion criteria*

Participants had to be hospital patients aged 18 years or above. The initial criteria they had to meet included: (1) being diagnosed with a progressive oncological condition and receiving palliative treatment at Ramathibodi Hospital, and (2) with a Palliative Performance Scale (PPS) of 40% or above. Beyond this, each participant (or their caregiver) had to agree to provide informed consent and answer the Thai Palliative Care Outcome Scale (POS) questionnaire.[11] In addition, they required full Internet access with an appropriate device.

*Exclusion criteria*

Exclusion criteria included participants with a risk of hospital admission for issues including spinal cord compression, suspected delirium, suicidal ideation, severe dyspnea (ESAS dyspnea > 7), gut obstruction, severe pain (ESAS pain > 7), and severe anemia (Hb < 7g/dL).

### Randomization

Randomization put participants into two groups: intervention and control. We used different block sizes (4 and 6) to randomize the participants and maintain an equal balance between

the groups. Randomization occurred at the level of individual patients, with an allocation ratio of 1:1. A sequential sealed envelope concealed the random sequencing.

**Usual care**

In addition to the support of a multidisciplinary team, participants in both groups received palliative care from their usual palliative specialists or Family Medicine residents training in palliative care. Patients could visit the hospital for follow-up appointments with other clinics as usual. If any abnormal symptoms were present, they would be treated according to standard care for each condition, including hospitalization when necessary. When applicable, patients made follow-up visits to the palliative care team. How they did this depended on their preference, the complexity of their illness, and the severity of the COVID-19 situation. Some patients visited the outpatient clinic, while others contacted the care team by phone. All patients could call the palliative care team by phone should their symptoms change.

**Intervention group**

*Procedure*

As the hospital ethics committee instructed us to combine care, participant care would alternate between standard care and telemedicine within six weeks of follow-up. Initially, participants received their usual outpatient care but would then receive a follow-up video appointment using the LINE application. Patients could contact the palliative care team via the LINE application to manage their symptoms, request or cancel an appointment, or discuss other related issues.

Attending physicians utilized the Edmonton Symptom Assessment System (ESAS) to assess the severity of the patient's symptoms and determine the need for follow-up appointments. The criteria they used for this are listed below:

- Mild (ESAS score 1-3): required follow-up at least every month
- Moderate to severe symptoms (ESAS score 4-7): required follow-up at least every two weeks
- Severe symptoms (ESAS score 8-10): required follow-up at least once a week

*Telemedicine application*

The study participants had the LINE application installed on their mobile phones, and they used this for telemedicine consultations. We chose the LINE application because COVID-19 was spreading rapidly and time was limited for developing a custom application, nor would such an application have necessarily kept up with user demands. In addition, most patients found the LINE application a convenient communication tool.

The LINE Official Account used in the research was closed to others outside the group of patients using it. Medical personnel and residents served as the account's administrators. To gain access, users first had to obtain permission from an administrator and authenticate their request. All account members (including administrators) had to use their actual names and have an identifiable profile picture. Everyone had to agree to maintain the privacy and confidentiality of patient information. Administrators verified both the patients' and caregivers' identities during their initial participation and follow-up visits. At least two of the four items listed below were required for verification:

- Patient's first and last names
- Date of birth
- Evidence of identity that included a photograph (such as an identity card or driver's license that had to include the patient's last name)
- Patient identification number (HN).

**Outcome measures**

The primary outcome measure was "quality of life" based on the POS. The secondary outcome measure was a comparison of the number of emergency department visits between the two groups.

**Data Collection**

The researcher and research assistants managed baseline measurements at both outpatient clinics and inpatient departments. During the study period in the second, fourth, and sixth weeks, blind calls were made to both groups of patients with blind interviews to complete POS questionnaires and generate data on emergency department visits. If a patient scored four or more for 'pain' or 'dyspnea', the research staff would request the attending physician manage the initial symptoms, and this might include adjusting pain medicine or postponing appointments.

**Questionnaires**

The POS[12] measures holistic palliative care outcomes. It consists of 12 questions covering

the main components of palliative care. Eight questions have a 5-point Likert-scale response from 0 (not at all) to 4 (overwhelming), two questions have three answer options (0-2-4), and participants answer one question ("What were your main problems over the previous three days?") with an extended 'free writing' response. The last question asked patients if they needed help filling out the questionnaire, and if they did, requested they state who provided them with assistance (0 - no, 1 - help from family or friend, 2 - help from staff).[13]

Patients answered questions according to their experience over the previous three days. Although it was not a unidimensional scale, researchers utilized a sum score to describe the outcome and compare groups next to single items, with higher scores indicating more severe problems.

**Sample size**

According to the study by Hermann et al., the mean and standard deviation of POS pain scores in the usual care group were 1.4 and 1.2. With a power of 0.80 and a Type I error of 0.05, we needed to include 64 patients (32 for telemedicine and 32 for the usual care group) in the study to show a mean difference of 1.0 points in the POS pain score between telemedicine and usual care groups.[14]

**Statistical analysis**

Continuous variables with normal distirbution were reported as mean and standard deviation (SD). If the data showed non-normal distribution, they were presented as the median and inter-quartile range (IQR). Categorical variables were presented as frequency and percentage. Mann-Whitney U test was applied to estimate the mean difference in POS score between patients receiving telemedicine and usual care at the second, fourth, and sixth weeks. The rate of Emergency Department visits between telemedicine and usual care groups was compared using Poisson Re-

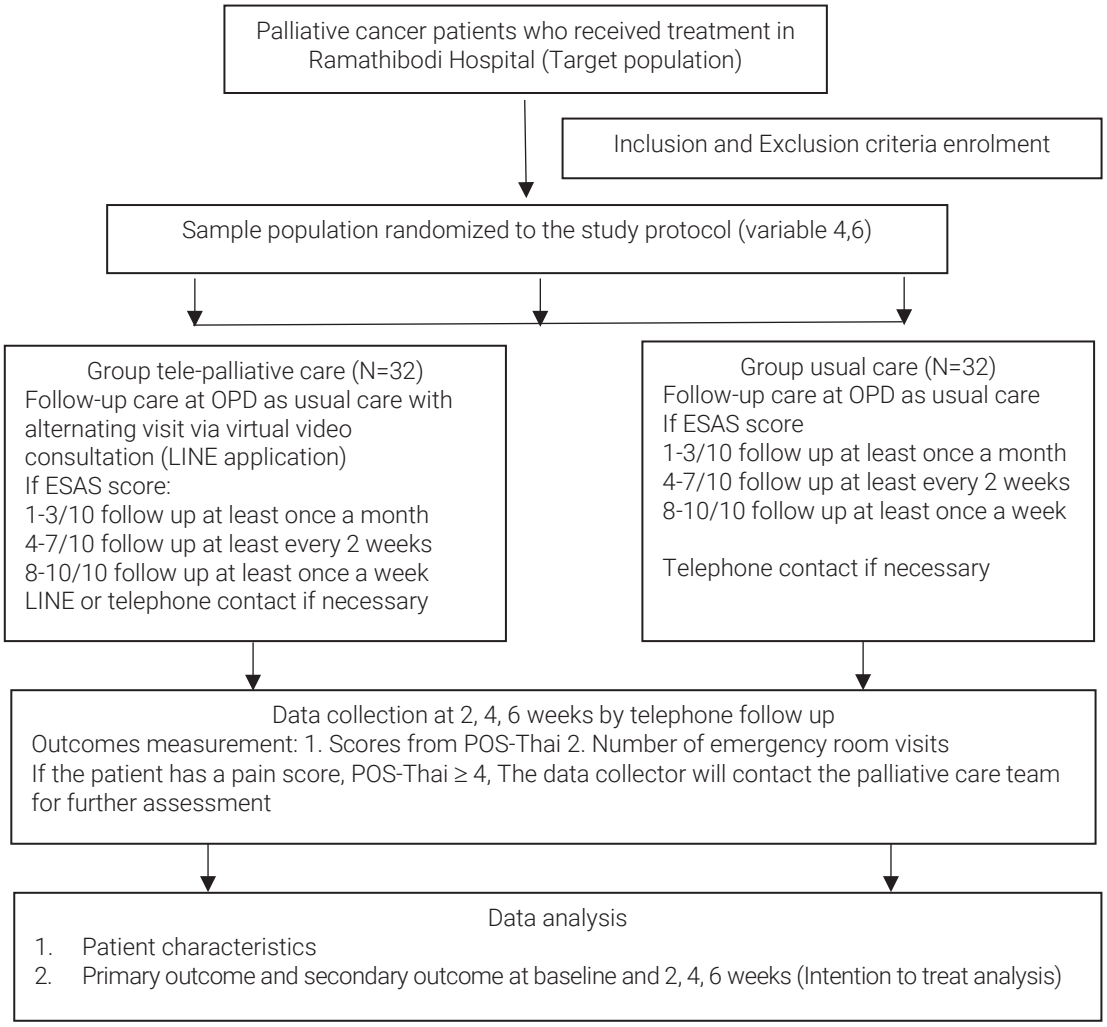


**Figure 1.** Protocol flow chart

gression Analysis. A p-value less than 0.05 was considered statistical significance. Researchers utilized STATA version 17.0 BE (Stata Corp, College Station, Texas) for all statistical analyses.

## Results

### Characteristics of Participants

Sixty-four patients showed an interest in participating in the study, but only 62 participants met the study criteria. We excluded individuals who were either not approached for participation for other reasons (n = 2) or were unwilling to participate (n = 2). Ultimately, 58 participants provided written informed consent and agreed to participate in the study. The participants were randomized and included in either the intervention group (n = 29) or the control group (n = 29). A total of 44 participants (75%) completed the study. Most of the participants who did not finish the study had died or were 'lost to follow-up' (Figure 2).

Table 1 presents demographic data on baseline characteristics. The primary outcome analysis included each of the 58 initial participants. The mean age of members of the intervention group was 62 years, while the control group's mean age was 66 years. More than half of the participants in the two groups were female. The majority of participants in both groups were married and lived with their families. The intervention group had a majority of participants with a primary school education (31%), followed by a bachelor's degree (31%), while the control group had a majority with a primary school education (31%). Most had utilized civil servant benefit schemes. Twenty-three participants had an informal caregiver who consented to the study and participated in the research. Lung cancer was the most frequently diagnosed primary cancer in both groups. The members of each group had similar baseline PPS scores. While 11 intervention group patients (38%) had PPS levels of 40-60%, ten

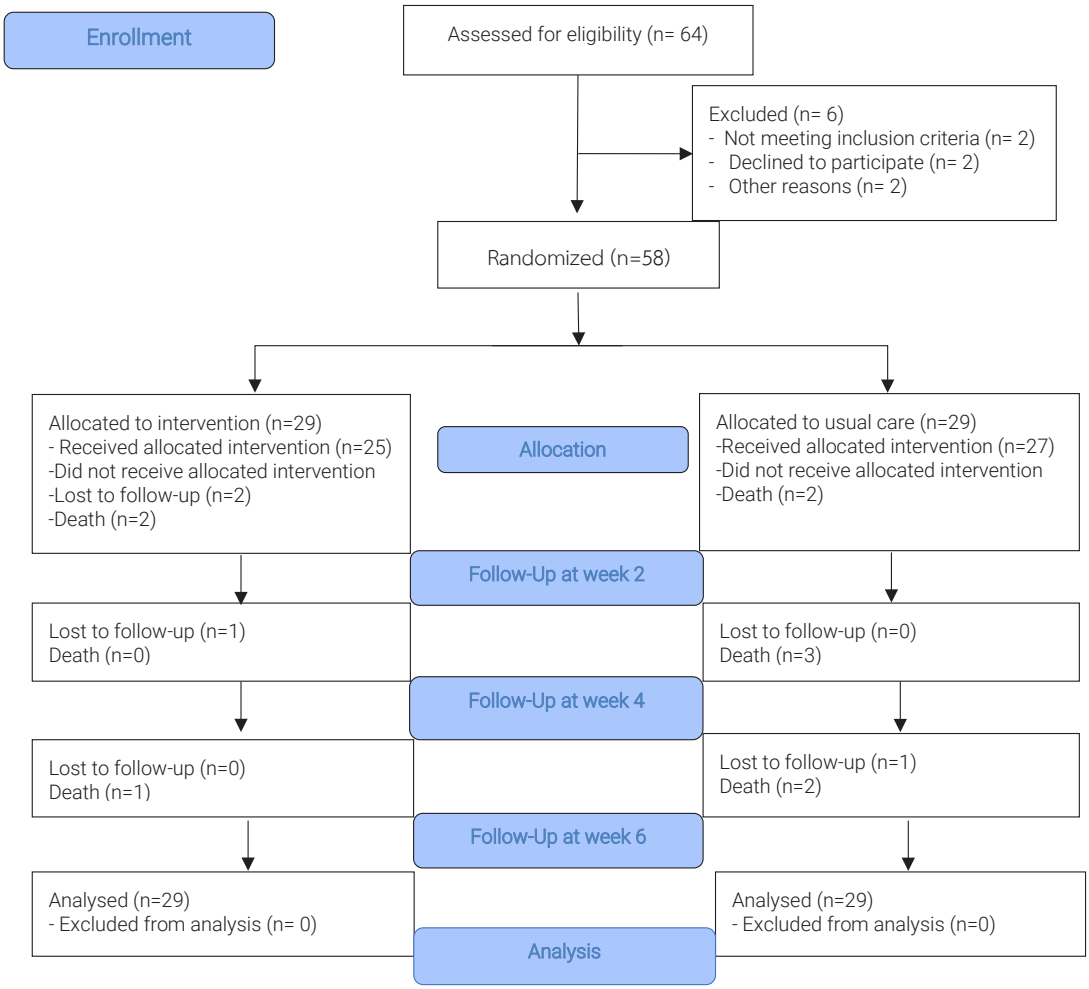


**Figure 2.** Results flow chart

**Table 1.** Baseline characteristics of participants

| Characteristics | Telemedicine with usual care (n=29) | Usual care (n=29) |
|---|---|---|
| Age (years), mean ±SD) | 62 (±14) | 66±14) |
| Sex | | |
| Male, n (%) | 14 (48%) | 12 (41%) |
| Female, n (%) | 15 (52%) | 17 (59%) |
| Status | | |
| Single, n (%) | 4 (18%) | 1 (3%) |
| Marriage, n (%) | 18 (62%) | 18 (62%) |
| Widows/divorce, n (%) | 7 (24%) | 10 (35%) |
| Education | | |
| Primary school, n (%) | 9 (31%) | 9 (31%) |
| High school, n (%) | 4 (14%) | 5 (17%) |
| Bachelor's degree, n (%) | 9 (31%) | 4 (14%) |
| Master's degree, n (%) | 4 (14%) | 2 (7%) |
| Others, n (%) | 3 (10%) | 9 (31%) |
| Occupational | | |
| Civil servant, n (%) | 2 (7%) | 2 (7%) |
| Company employee, n (%) | 3 (10%) | 0 |
| Employed, n (%) | 1 (3%) | 2 (7%) |
| Housewife, n (%) | 3 (10%) | 8 (28%) |
| Private business, n (%) | 3 (10%) | 2 (7%) |
| Others, n (%) | 17 (59%) | 15 (52%) |
| Place of living | | |
| Home, n (%) | 29 (100%) | 29 (100%) |
| Nursing home, n (%) | 0 | 0 |
| Others, n (%) | 0 | 0 |
| Health insurance | | |
| Civil servant Scheme, n (%) | 13 (45%) | 12 (41%) |
| Social Security Scheme, n (%) | 1 (3%) | 3 (10%) |
| Universal Coverage Scheme, n (%) | 12 (41%) | 11 (38%) |
| Cash, n (%) | 3 (10%) | 3 (10%) |
| Others, n (%) | 0 | 0 |
| Primary cancer | | |
| Lung cancer, n (%) | 7 (24%) | 5 (17%) |
| Breast cancer, n (%) | 4 (14%) | 2 (7%) |
| Colon cancer, n (%) | 3 (10%) | 5 (17%) |
| Liver cancer, n (%) | 1 (3%) | 0 |
| Brain tumor, n (%) | 1 (3%) | 0 |
| Skin cancer, n (%) | 0 | 0 |
| Ovarian cancer, n (%) | 0 | 1 (3%) |
| Leukemia, n (%) | 0 | 0 |
| Cervical cancer, n (%) | 2 (7%) | 2 (7%) |
| Gastric cancer, n (%) | 0 | 0 |
| Head & neck cancer, n (%) | 3 (10%) | 3 (10%) |
| Bladder cancer, n (%) | 2 (7%) | 0 |
| Prostate cancer, n (%) | 2 (7%) | 4 (14%) |
| Cholangiocarcinoma, n (%) | 0 | 2 (7%) |
| Unknown primary of tumor, n (%) | 0 | 0 |
| Others, n (%) | 4 (14%) | 7 (24%) |

**Table 1.** Baseline characteristics of participants (Continuous)

| Characteristics | Telemedicine with usual care (n=29) | Usual care (n=29) |
|---|---|---|
| Underlying disease | | |
| Diabetes mellitus, n (%) | 6 (20%) | 2 (7%) |
| Hypertension, n (%) | 8 (28%) | 9 (31%) |
| Dyslipidemia, n (%) | 6 (21%) | 8 (28%) |
| Cardiovascular disease, n (%) | 1 (3%) | 4 (14%) |
| Congestive heart failure, n (%) | 0 | 1 (3%) |
| Chronic obstructive pulmonary disease, n (%) | 1 (3%) | 0 |
| Chronic kidney disease, n (%) | 2 (7%) | 2 (7%) |
| Depression, n (%) | 2 (7%) | 1 (3%) |
| Anxiety, n (%) | 0 | 2 (7%) |
| Others, n (%) | 5 (17%) | 10 (34%) |
| Palliative Performance Scale at baseline, n (%) | | |
| 40, n (%) | 1 (3%) | 4 (14%) |
| 50, n (%) | 6 (21%) | 3 (10%) |
| 60, n (%) | 4 (14%) | 3 (10%) |
| 70, n (%) | 8 (28%) | 7 (24%) |
| 80, n (%) | 4 (14%) | 7 (24%) |
| 90, n (%) | 6 (21%) | 5 (17%) |
| Participants, n (%) | | |
| Patients, n (%) | 17 (61%) | 17 (59%) |
| Caregivers, n (%) | 11 (39%) | 12 (41%) |
| Palliative care Outcome Scale at baseline, n (%) | 10.3 (±5) | 11 (±6) |

**Table 2.** The Palliative care Outcome Scale (POS) at 2, 4, and 6 weeks between telemedicine with usual care and usual care groups

| Palliative care Outcome Scale (POS) | Median (IQR) | | |
|---|---|---|---|
| | Telemedicine with usual care (n=29) | Usual care (n=29) | P-value |
| At 2 weeks | 8.0 (6,11) | 9.0 (5,12) | 0.75 |
| At 4 weeks | 6.0 (4,10.5) | 8.5 (5.5,15.5) | 0.06 |
| At 6 weeks | 6.5 (2.5,13) | 7.0 (5,11) | 0.77 |

patients in the control group (34%) had the same PPS levels. The COVID-19 pandemic and other time constraints forced this study to conclude prematurely (after only 12 months) and before reaching a calculable sample size.

### Quality of life

At the baseline, the mean POS for the intervention group (10.3 ± 5) was similar to that of the control group (11 ± 6). Results for quality-of-life outcomes indicated that the group receiving telemedicine and standard care received scores of 8 (6,11), 6 (4,10.5), and 6.5 (2.5,13) at the end of each period while the other group received outcome scores of 9 (5,12), 8.5 (5.5,15.5), and 7 (5,11) for the same periods. Analysis suggested there was no statistically significant difference in these outcomes.

### Secondary outcomes

The ratio rate of Emergency Department visits did not differ between the intervention and control groups interpreted by 95% CI at 2, 4, and 6 weeks [ RR 0.65 95% CI 0.15- 2.70], [RR 2.27 95% CI 0.69 -7.14], [RR 4.17 95% CI 0.49 -33.33] respectively.

**Table 3.** The number of Emergency Department visits at 2, 4, and 6 weeks between telemedicine with usual care and usual care groups

| Time | Intervention | N | Number of Emergency Department visits | RR (95%CI) |
|---|---|---|---|---|
| 2 weeks | Usual care | 27 | 5 | 1 |
| | Telemedicine | 25 | 3 | 0.65 (0.15, 2.70) |
| 4 weeks | Usual care | 24 | 4 | 1 |
| | Telemedicine | 24 | 9 | 2.27 (0.69,7.14) |
| 6 weeks | Usual care | 20 | 1 | 1 |
| | Telemedicine | 24 | 5 | 4.17 (0.49,33.33) |

## Discussion

This study found that patients receiving telemedicine combined with conventional care had a median POS score that was not significantly different from patients receiving usual care. As a result, there was no difference in the quality of life between two groups. This is consistent with research by Hebert et al.,[15] which compares regular palliative care home visits with a combination of regular home visits and visits via video, but contradicts a study by Hoek et al.[10] Hoek's study suggested that patients receiving weekly video consultations resulted in higher Total Distress Scores at 12 weeks of follow-up compared to the control group. It is important to note that the subjective nature of patients and caregivers assessing their quality of life and that of others might impact the reliability of the research results. While Hebert's study was conducted at palliative home care visits in rural regions, Hoek's study was conducted at outpatient clinics and a regional home care organization.

The study included three patients in the telemedicine with the conventional care group whom researchers lost contact with and three patients who died. A total of seven patients in the usual care group died before the trial ended, and one patient lost contact. Although the study exit rates in both groups were similar, comparing the number of patients who were lost to follow-up with the total randomized population showed an adverse impact on the research results.

Although our quantitative research did not indicate a clear difference in outcomes between the two groups, many qualitative research studies suggest researchers receive positive feedback regarding cost reductions and waiting times to see doctors.[16,17] There are several possible explanations for why this research did not produce the same results. One possibility is that participants had a PPS score of 40% or more, indicating a better prognosis and lower symptom burden than those with lower scores.[18] In addition, those in supra-tertiary care received treatment from multiple medical teams that included palliative care specialists and oncologists focused on providing palliative care. As a result, most patients were already receiving excellent palliative care, and most likely, there was no perceivable difference in the care they received because of the study.

The mean baseline POS scores for the two groups were 10.3 and 11 out of 40. The median scores for both groups at weeks 2, 4, and 6 were between 6 and 9 points and considered good outcomes. The research results might not, therefore, demonstrate the benefits of telemedicine. In addition, most of the patients participating in the study were married and received the care and support of their families. The group members probably had several resources available to support their care, and the impact of telemedicine might, therefore, have only been negligible.

Unlike other studies, this research addressed telemedicine services provided through the LINE application designed for the purpose. The researcher chose a LINE application because COVID-19 was spreading rapidly, and the development of a custom application might not have kept up with user demands. Being very popular amongst Thais,[19] it also proved convenient for most participants.

### Strengths

This study has several noteworthy strengths. To begin, our study was a randomized controlled trial, which is a method with low bias and controlled variables. Second, the process of randomly assigning patients to either of the groups and placing

the order in a sealed envelope to conceal it from researchers proved beneficial to the study's validity. Third, researchers analyzed data based on the groups into which patients were initially randomly assigned (intention-to-treat analysis). Therefore, it preserved the prognostic balance afforded by randomization. Finally, the POS assessment methods used at weeks 2, 4, and 6 (when research assistants conducted phone follow-ups) yielded clear and complete results.

### Limitations

This study does have some drawbacks. First, this study's follow-up duration might have been shorter than in earlier ones. In earlier trials, patients were frequently evaluated and given follow-up visits after two to six months.[10,14,15] Additionally, the research took place in only one hospital - Ramathibodi Hospital. As a supra-tertiary care hospital, most patients had sufficient awareness of their disease and its progression. They were also followed by other hospital departments which may affect the results of our study. Furthermore, the COVID-19 pandemic impacted research recruitment because fewer patients visited the hospital to address follow-up symptoms. Lastly, telemedicine via the LINE application might not have proper security with limited consultation records for analysis. Apart from that, when it comes to sensitive communication, telemedicine cannot provide an empathic direct human connection.

### Clinical implications

As stated previously, although our research had not determined the effectiveness of the approach, the COVID-19 pandemic spurred a rapid increase in the adoption of telemedicine in palliative care. However, despite little quantitative data in the area, many qualitative research reports agreed telemedicine offered benefits, especially regarding reducing waiting times to see a doctor, reducing travel expenses for patients, and reducing the number of visits made to hospital emergency departments.[20,21] This research took place at university hospitals in both urban and rural areas. Applying its findings to provincial or community hospitals with a higher density of patients may serve to reduce their doctor waiting and patient traveling times. Telemedicine might occur both during and after working hours and result in healthcare professionals having increased workloads.[22] Telemedicine, therefore, requires the appropriate allocation of adequately compensated healthcare workers and the utilization of excellent digital infrastructure. According to the result, palliative patients with a PPS of more than 40% may select either standard medical care or telemedicine.

## Conclusions

The quality of life and several Emergency Department visits made by patients who received telemedicine (combined with usual care) did not differ from patients in the group receiving only conventional care. Further research should focus on conducting multi-center studies to verify this study's results in different contexts. Including a higher number of participants coupled with lengthier follow-up periods may help to establish more differences in outcomes between the two groups.

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## Competing interests

The authors declare that there was no conflict of interest.

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