



Community Care for Cancer Patients in Rural Areas: An Integrated Regional Cancer Center and Public Health Center Partnership Model

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Purpose: The accessibility of medical facilities for cancer patients affects both their comfort and survival. Patients in rural areas have a higher socioeconomic burden and are more vulnerable to emergency situations than urban dwellers. This study examined the feasibility and effectiveness of a cancer care model integrating a regional cancer center (RCC) and public health center (PHC). **Methods:** This study analyzed the construction of a safety care network for cancer patients that integrated an RCC and PHC. Two public health institutions (an RCC in Gyeongnam and a PHC in Geochang County) collaborated on the development of the community care model. The study lasted 13 months beginning in February 2019 to February 2020. **Results:** The RCC developed the protocol for evaluating and measuring 27 cancer-related symptoms, conducted education for PHC nurses, and administered case counseling. The staff at the PHC registered, evaluated, and routinely monitored patients through home visits. A smartphone application and regular video conferences were incorporated to facilitate mutual communication. In total, 177 patients (mean age: 70.9 years; men: 59%) were enrolled from February 2019 to February 2020. Patients' greatest unmet need was the presence of a nearby cancer treatment hospital (83%). In total, 28 (33%) and 44 (52%) participants answered that the care model was very helpful or helpful, respectively. **Conclusion:** We confirmed that a combined RCC-PHC program for cancer patients in rural areas is feasible and can bring satisfaction to patients as a safety care network. This program could mitigate health inequalities caused by accessibility issues.

Key Words: Cancer care facilities, Home care service, Community networks, Telemedicine, Distance counseling, Rural health services

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요약

목적: 암환자의 의료서비스에 대한 접근은 암환자의 안녕과 생존에 영향을 미친다. 시골의 환자들은 도시에 거주하는 환자들에 비해 상대적으로 사회경제적인 부담이 크고, 응급상황에서 취약한 상황에 놓여 있다. 본 연구에서는 지역암센터와 보건 의료서비스 연계모델의 실행가능성 및 효과를 확인하기 위하여 진행하였다.

방법: 본 연구에서는 지역암센터와 보건소의 통합 안전 돌봄 프로그램의 구조를 분석하였다. 두 지역 공공의료기관인 경남 지역암센터와 거창군 보건소가 협력하여 지역기반 돌봄 프로그램을 만들어 2019년 2월부터 2020년 2월까지 13개월 동안 운영하였다.

결과: 이 프로그램을 통하여 27개의 암관련 증상의 측정 프로토콜을 개발하였고, 보건지소의 간호사들을 교육하였으며, 의료 전문가 사이의 자문 시스템을 마련하였다. 보건지소의 보건 의료인력은 해당 환자를 등하고, 정기적인 방문을 통한 모니터링과 평가를 시행하

였다. 스마트폰 어플리케이션 프로그램을 개발하여 도입하였고, 화상회의를 통하여 상호 의견 교환을 활발히 하였다. 2019년 2월부터 2020년 2월까지의 프로그램 기간 동안 177 명(평균연령: 70.9세; 남자: 59%)가 등록되었다. 환자들이 느끼는 가장 큰 불편감은 거주지 인근에 암치료병원이 없다는 점이었다(83%). 프로그램에 참여한 사람 중 28명(33%)은 프로그램이 큰 도움이 되었다고 답하였고, 44명(52%)은 도움이 되었다고 답하였다.

결론: 암 환자에 대한 지역암센터-지역 보건소 연계 모델은 실현 가능하며, 환자들에게 만족감을 가져다 줄 수 있는 안전 돌봄 연계망이 됨을 확인하였다. 이 프로그램을 통하여 의료접근성의 문제로 인해 유발되는 의료 불균형을 해소 할 수 있을 것으로 기대된다.

중심단어: 암 돌봄 기관, 홈케어서비스, 지역돌봄망, 원격진료, 원격리 상담, 시골지역 의료서비스

Supplement 1. Example Questionnaire to Determine 27 Cancer-related Symptoms and Counseling Protocol.

1. Abdominal pain

1. Where do you feel abdominal pain?

- | | | |
|------------------------------|--|----------------------------------|
| <input type="checkbox"/> RUQ | <input type="checkbox"/> Periumbilical | <input type="checkbox"/> LLQ |
| <input type="checkbox"/> LUQ | <input type="checkbox"/> Whole abdomen | <input type="checkbox"/> Complex |

2. What is the pattern of abdominal pain?

- | | |
|--|---|
| <input type="checkbox"/> It hurts on and off | <input type="checkbox"/> Stiff or throbbing |
| <input type="checkbox"/> It hurts sharply | <input type="checkbox"/> Other () |

3. The time when the abdominal pain started and the presence of pain in the past

- Since (time/date), the pain that I have had before became even worse
 Since (time/date), I developed abdominal pain that I have never had before

4. What other symptoms do you have with abdominal pain?

- | | | |
|--|---------------------------------------|--|
| <input type="checkbox"/> Vomiting/nausea | <input type="checkbox"/> Fever | <input type="checkbox"/> Chills or rigor |
| <input type="checkbox"/> Diarrhea | <input type="checkbox"/> Constipation | <input type="checkbox"/> Shortness of breath |
| <input type="checkbox"/> Loud rumbling | | |

5. How is your pain when pressing the painful part of the stomach with the hand (tenderness status)?

- | | | |
|--|------------------------------------|--|
| <input type="checkbox"/> A little better | <input type="checkbox"/> No change | <input type="checkbox"/> It hurts more |
|--|------------------------------------|--|

6. How is your pain if you deliberately cough (rebound tenderness status)?

- | | |
|--|---|
| <input type="checkbox"/> It hurts more | <input type="checkbox"/> There is no difference |
|--|---|

7. How severe is your pain?

- | | |
|---------------------------------|--|
| <input type="checkbox"/> Mild | <input type="checkbox"/> Moderate |
| <input type="checkbox"/> Severe | <input type="checkbox"/> Unbearably severe |

Counselors' possible measures against abdominal pain

- In general, as taking painkillers is not a problem and patients with cancer are usually prescribed medications for sudden pain (IR Codon or Fentora), the counselor allows the patient to take them after examining the patient's symptoms.
- Intermittent pain or pain accompanied by a loud rumbling → Administer anticonvulsants such as Buscopan or Tiropra.
- Sharp pain → Prescribe gastrointestinal medications such as H2 blockers or antacids.
- Prescribe constipation medication if more than 3 days have passed since the patient's last bowel movement (MgO, Duphalac, or Bisacodyl).

2. Chest pain

1. In which part of your chest do you feel pain?

- | | | |
|-------------------------------|---------------------------------|--------------------------------|
| <input type="checkbox"/> Left | <input type="checkbox"/> Middle | <input type="checkbox"/> Right |
|-------------------------------|---------------------------------|--------------------------------|

2. What is the pattern of chest pain?

- | | |
|---|---|
| <input type="checkbox"/> It hurts as though it is tightening | <input type="checkbox"/> It hurts as though it is tearing |
| <input type="checkbox"/> It hurts whenever I take a deep breath | <input type="checkbox"/> Other () |

3. The time when the chest pain started and the presence of pain in the past

- Since (time/date), the pain that I had before became even worse
 Since (time/date), I developed a chest pain that I have never had before

4. What other symptoms do you have with chest pain?

- | | | |
|--|--------------------------------------|--|
| <input type="checkbox"/> Cough | <input type="checkbox"/> Fever | <input type="checkbox"/> Chills or rigor |
| <input type="checkbox"/> Sputum | <input type="checkbox"/> Hemoptysis | <input type="checkbox"/> Shortness of breath |
| <input type="checkbox"/> Nausea/vomiting | <input type="checkbox"/> Acid reflux | |

5. Was there evidence of thrombosis in the lower extremities or abdomen on CT within the last 6 months (CT image data check)?

- Yes No

6. How severe is your pain?

- | | |
|---------------------------------|--|
| <input type="checkbox"/> Mild | <input type="checkbox"/> Moderate |
| <input type="checkbox"/> Severe | <input type="checkbox"/> Unbearably severe |

Counselors' possible measures against chest pain

- In general, as right chest pain is rarely a heart problem, the counselor reassures the patient.
- If the pain is severe, let the patient take medications such as Tylenol or NSAID or painkillers that the patient already has.
- If the patient complains of chest pain and has lung cancer, be sure to ask about accompanying symptoms such as coughing, sputum, or fever. If there are any, advise them to visit the hospital since it may be a pre-symptom of pneumonia; otherwise, prescribe painkillers.

3. Nausea and vomiting

1. What other symptoms do you have with nausea/vomiting?

- | | | |
|---|--|--|
| <input type="checkbox"/> Nausea/vomiting | <input type="checkbox"/> Fever | <input type="checkbox"/> Chills and rigor |
| <input type="checkbox"/> Diarrhea | <input type="checkbox"/> Constipation | <input type="checkbox"/> Feeling indigested after eating |
| <input type="checkbox"/> Rumbling after meals | <input type="checkbox"/> Severe stomach-ache | |

2. How is it related to food intake?

- | | |
|--|--|
| <input type="checkbox"/> I vomit as soon as I eat | <input type="checkbox"/> I vomit about 30 minutes to 1 hour after eating |
| <input type="checkbox"/> I vomit regardless of food intake | |

3. How many times a day do you vomit?

- | | | | |
|---------------------------------------|---------------------------------------|--|---|
| <input type="checkbox"/> 1 to 2 times | <input type="checkbox"/> 3 to 5 times | <input type="checkbox"/> 6 to 10 times | <input type="checkbox"/> 10 times or more |
|---------------------------------------|---------------------------------------|--|---|

4. How much water or food are you currently having?

- | | |
|--|--|
| <input type="checkbox"/> I cannot eat water or food at all | <input type="checkbox"/> I just barely can drink water |
| <input type="checkbox"/> I eat a little food | |

5. How is your current strength?

- | | |
|---|-------------------------------------|
| <input type="checkbox"/> I am lying down because I have no strength, even to go to the bathroom | |
| <input type="checkbox"/> I can wash or go to the bathroom by myself | <input type="checkbox"/> I can walk |

6. Have you ever had chemo treatment within 2 weeks?

- Yes No

7. How severe is your nausea/vomiting?

Mild

Severe

Moderate

Unbearably severe

Counselors' possible measures against nausea/vomiting

- When involved in chemotherapy, steroids such as metoclopramide and dexamethasone, along with fluids such as 5% D/W or 5% D/S, are prescribed intravenously or orally.
- In the case of symptoms of intestinal obstruction (not digesting well when eating food, or no stool while experiencing a stomachache accompanied by a 'glurp' sound), it is recommended not to take anything other than water.
- Assess whether they are also constipated.
- If they are vomiting or feeling nauseous after chemotherapy, do not force them to eat or drink.
- If the vomit color is green or if the vomit contains bile, allow the patient to fast and recommend a hospital visit since these are symptoms of intestinal obstruction.