Electronic distance nursing system-E-KANGO—model simulation and assessment

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Background
- Japanese government is shifting the elderly from hospitals to community care settings.
- In Japan, elderly population (65 years old and over) is 23.05% (2010).
- 24% of the elderly live alone (2009).
- 7837 communities with 50% and more elderly population and no children younger than school age (2006).
- 5500 homecare agencies (nursing) in Japan (2009).

In today’s world, we are surrounded by the latest advances in IT; however, not all homecare agencies and clients enjoy the benefits of IT, this is, especially true of those who are older and with physical disabilities, and who reside far from major cities in cold and vast areas where temperature can fall as low as –30°C.

Hokkaido Prefecture
- Northernmost island (22% of Japan’s total area)
- 5.5 million residents (4.3% of Japan’s population)
- 262 homecare nursing agencies (2006)
- 1100 home care nurses (FTE) (2006)
- Hokkaido is one of the areas that has the fewest medical facilities.
- Many older adults in Hokkaido opt to stay in hospitals or facilities as a precaution against being stranded in inclement weather.
- Hokkaido has the 2nd highest elderly related medical costs.

Study Site: Esashi-town, Hokkaido
2007 data shows:
- 9815 residents
- 4021 households
- Main industries: fishery and dairy farming
- Forest: 81%
• Elderly’s population: 26%
• Only one home care nursing agency serving 55 residents

**Connecting entire households in remote communities**
The Ministry of Internal Affair & Communication provided the funding to 67 town/village in Japan to establish broad-band service (optical fire) and Esashi was one of them.

By 2011, town plans to complete fiber optical network and to provide a terminal to every household.

Therefore Esashi was the best study site to test our model.

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**Study site: town of Esashi**
Purpose of our study
To construct a user-friendly and inexpensive electronic distance nursing model (E-KANGO)* for the home care environment.

*E represents Electronic as well as “good” in Japanese, and KANGO is Japanese for “nursing.”

This study was funded by a grant from the Ministry of Health, Labour & Welfare in Japan (2009).

Subjects

2009
1) bedridden woman in her 50’s and her mother (79 yrs) who was a key care provider and lived in Esashi town.

2) woman in her 50’s with multiple disabilities, living alone in Sapporo City where the largest city in Hokkaido (pop. 2million).

3) two home care nursing agencies in Esashi and Sapporo.

2010-2011 (in progress)
1) bedridden man in his 50’s in Esashi town
2) woman in her late 70’s in Esashi town.

3) town’s health and welfare center (public health nurse center)

All subjects were receiving homecare nursing services.

**Ethical considerations**

- After the Ethics Committee of Sapporo City University approved the study plan, the study process was fully explained to the subjects who volunteered willingly and voluntarily.

- The subjects were assured that they can stop participating the study at any time without any question, and all of the collected data will be converted into numeric code to protect individual’s privacy.

- The study results are used only for academic purposes, including for academic conferences and theses.

**E-KANGO system outline**
(Left) Homecare agency (nurse): chatting with client & checking data entered by client daily. (Right) Homecare patient and family practising on the model

Daily video chat (TV phone) between home care nurse and bedridden client
Step 1. A client enters clinical information such as appetite, meal/liquid intake daily on this screen.
Step 2. A nurse views this screen which contains clinical information entered by a client daily. (see step 1.)

Interface for homecare client (2009 version)
Interface for homecare client (2010 version)

Interface for homecare nurse (2010 version)
A subject (50s) entering daily clinical data

A subject entering data daily
A subject (79 yrs old) entering clinical data daily. (BP, TPR, etc.)

Results
• All of the clients answered that it was much easier to operate the system that they initially expected.
• All of the clients stated that they feel about E-KANGO much better than telephone alone because they could talk and see her/his nurse at any time.
• The homecare clients and the homecare agency in the rural area expressed greater interests in E-KANGO than those in the metropolitan area like Sapporo City.

Improvement made by 79 yrs old subject over one month

This 79 yrs old never used PC before this study and had declining vision. Her daily input (time) improved 50% by the 10th day and 75% by 30th day after changing keyboard to touch panel screen and added animated icons as an instructional guide instead of letters.

Home care nurses
All nurses at homecare agency expressed continuous use of E-KANGO because the system allows them to:
• assess the clients visually as needed
• accumulate large volume of digital data including photos (e.g. pressure ulcer site)
• review the video (e.g. chatting) repeatedly to confirm client’s condition as needed
• utilise existing PC equipment without adding costly IT equipment.

Conclusions
E-KANGO model could be complement to homecare (for municipals, nurses, and homecare patients) both particularly in rural areas without adding costly IT equipment.

E-KANGO model may allow homecare clients to stay home as long as they wish, even during winter and/or become alone at home.