

Nursing Practice Supporting the Transition of Technology-Dependent Children from Hospital to Home

Shiomi Kanaizumi ¹

Backgrounds & aims : The number of children with chronic conditions who receive care at home, particularly those who are dependent on medical technology are rapidly increasing. Systematic studies about nursing practice during the transition of technology-dependent children from hospital to home are very limited in Japan. This study explored the nursing practice supporting the transition of technology-dependent children from hospital to home. **Methods :** Qualitative descriptive design was used. Data were collected via semi-structured interviews from 15 nurses in three different settings : nurses of inpatient pediatric units ; nurse discharge coordinators ; and home care nurses. **Results :** Nursing practices unique to each of the three settings were identified ; hospital primary nurses advocated for the parents ; nurse discharge coordinators assumed the mediating role ; home care nurses respected and monitored parents' way of care. Promoting parents' self-efficacy was a key role common in hospital and home care nurses. The roles of the nurse discharge coordinators in dealing with this pediatric population were newly reported. **Conclusions :** Nursing practices of each setting were identified. The findings are expected to guide the nurses to recognize and appreciate their roles for each other which in turn would enable development of nurse-to-nurse collaboration for successful transition. (Kitakanto Med J 2013 ; 63 : 199~208)

Key words : technology-dependent children, transition, home care, nursing practice

Introduction

Many children with perinatal problems, congenital illnesses, or traumatic injuries have survived due to recent technological advances in medical care, although a considerable number of these children must live with disabilities. Advances in medical technology and care management have allowed children who are dependent on technology such as home mechanical ventilation (HMV) to receive care at home.¹⁻³ Naturally, children are to be nurtured within the family filled with love,⁴ and home care enables social interaction opportunities for the children.⁵ Normalization, nurturing home environment, enhanced quality of life, and improved development are reported as the benefits of home care for the child.⁶ Thus, receiving care in the home environment may improve the quality of life for the child and family and promote the child's development;⁷ however, the discharge process can be complicated and challenging depending upon the com-

plexity of the child's condition and the family situation. Tearl et al.² reported that medical as well as non-medical obstacles may delay the hospital discharge of children. Various obstacles, such as underdeveloped community service system for children with special health care needs, lack of formal care management service for pediatric population, and lack of information available to hospital medical staffs preparing for discharge, complicate the transition to home care, even when both the child and the family wish to make the transition.⁷ Other situations considered to be the obstacles are that the families have difficulties in imagining the life with the child at home or tend to possess fear about caring the child at home.^{8,9}

It has been reported that technology-dependent children and their families require help addressing medical, psychosocial, developmental, educational and/or environmental issues ;¹⁰ therefore, multidisciplinary involvement is required.¹⁰⁻¹² Physicians, nurses, rehabilitation staffs, medical social workers,

¹ Department of Nursing, Gunma University Graduate School of Health Sciences, 3-39-22 Showa-machi, Maebashi, Gunma 371-8514, Japan

Received : May 15, 2013 Accepted : June 13, 2013

Address : SHIOMI KANAIZUMI Gunma University Graduate School of Health Sciences, 3-39-22 Showa-machi, Maebashi, Gunma 371-8514, Japan

public health nurses, care workers, equipment venders, municipal social welfare officers, and school or care center staffs are generally given considerations to be included in home care of children in the literature.^{7,13-17} Care coordination and cooperation with communities are essential, especially for technology-dependent children, in order to meet individual health needs. Nurses are equipped with medical knowledge and skills, and are qualified to know about the life of the children and their families, and therefore, are considered as logical choices for fulfilling the roles of making comprehensive care plans by taking the characteristics of the child and the family into account, and coordinating among the health care team in supporting the discharge of children.^{16,18,19} However, there are few well-established strategies for nurses to carry out these roles and each facility must therefore proceed largely by trial and error.¹⁸

Tagawa et al.²⁰ reviewed the literature concerning home care for technology-dependent children, and found that 58% of the published articles were case reports or descriptions of the practices of a certain facility, which was larger than the percentage of original articles or research papers. In this paper, Tagawa et al.²⁰ reported that of the articles related to care during hospitalization, descriptions of parent education, such as technical training for medical devices, were the most common, and that some of these reports stressed the necessity of multidisciplinary cooperation to improve the quality of life of children and families, but relatively few reported practical strategies for actually implementing such cooperation.

Multiple studies on transitional care in hospitals or home care in western countries have been conducted,^{2,3,10-12,21-23} and "Case management" has been described as a collaborating model of nursing practice that seems to be effective means of providing care to technology-dependent children and their families.^{10,11} But none has investigated the role of nurses in multiple care settings throughout the transition process.

The present study aimed to identify nursing practice supporting the transition of technology-dependent children to home implemented by nurses in the following three settings in Japan: staff nurses in inpatient pediatric units; nurses in designated discharge coordinating sections in hospitals; and home care nurses.

Conceptual Framework

"The transition" of a technology-dependent child from hospital to home consists of not only the period before discharge, but also includes the introductory stage of home care defined as the period until the life at home becomes stable after discharge.^{18,24-26}

Figure 1 shows the conceptual framework of the

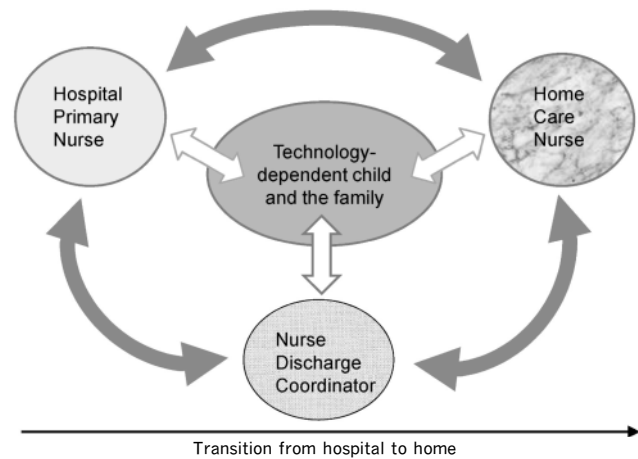


Fig 1. Conceptual framework

present study. The technology-dependent child and the family are in the center experiencing the transition. The hospital primary nurse, nurse discharge coordinator, and home care nurse each support the child and family during the transition from hospital to home. Practice of each type of nurse, and how the identified practices are related have yet to be clarified.

Methods

1. Selection and description of participants

Participants included nurses who had been involved in the transition of a technology-dependent child to home, from the following three care settings: primary nurses in inpatient pediatric units, nurses in designated discharge coordinating sections in hospitals, and home care nurses. A criterion for the participants to be included in the study was having over three years of nursing experience.

Inclusion criteria for the children were: (a) Group I-III dependence on a mechanical device (s) to sustain life, such as mechanical ventilation, prolonged intravenous administration of nutritional substances or drugs, tracheotomy care, suctioning, oxygen support, or tube feedings, as defined by the Office of Technology Assessment¹⁰; (b) discharged to his or her home; and (c) aged less than six years (pre-school age).

The recruitment process was case-based. The primary nurse and the designated nurse discharge coordinator who had been in charge of the child who met those inclusion criteria were referred by the head nurse of the unit within a week prior to or after the child's discharge. The home health nursing agency that was making visits to the child was then referred through the nurse discharge coordinator.

2. Data collection

A semi-structured interview was conducted during sixth days to two months after the child's discharge to

investigate the nursing care provided during the transitional period. Interviews were conducted in a quiet, isolated room in the hospital or home health agency in order to ensure privacy. The interview guide was developed referring to the literatures on case management or care-management programs,^{10,11,18} and comprised the following five parts in an attempt to obtain data concerning the contents of nursing of each of three settings in each of these five aspects: (1) the decision-making process for home care (for pediatric unit nurses) or how the child and/or family was referred to the section or agency (for discharge coordinators and home health nurses); (2) nursing care they had provided or were providing for the transition; (3) assessment and adjustment of the home environment; (4) interdisciplinary relationships and utilization of social resources; and (5) child development. And finally, the participants were asked to talk free about anything concerning the transition of the child. The interviews were audio-recorded.

Data regarding the child's age, diagnosis, duration of hospitalization, type of dependency, and number of siblings were collected from the chart. Type of dependency was also confirmed through the interview.

3. Ethical considerations

Participants (the nurses) were informed of the purpose of the study, the study methods, the contents of the data to be collected, that the confidentiality of all participants would be maintained, and that the study results would be published in an academic journal. They were also informed that participation in the study was strictly voluntary. Yet the name of the nurse in charge of the child was informed to the author by the head nurse or nurse discharge coordinator, the author directly made contact with the nurse participant for these explanations. The information was explained orally using an explanatory handout, which was then given to each participant. Participants signed a consent form if they agreed to participate. Parents were also informed of the study purpose, and their signatures were obtained as well. All interview data were anonymized and reviewed repeatedly to exclude any data that could identify the individuals. The study was approved by the ethics review committee of the author's university.

4. Data analysis

The qualitative descriptive method described by Greg²⁷ was used for data analysis. Greg's method aims to clarify the actual situation from the emic viewpoint, and is suitable for exploratory studies.

All interviews were transcribed verbatim, and analyzed by the following steps. Interview transcripts

were reviewed repeatedly prior to coding. Transcribed data were then coded using the words spoken by the participants as much as possible. Codes were classified by comparing the differences or similarities, and then labeled to form sub-categories. Sub-categories were further abstracted to form categories and then core categories.

To ensure trustworthiness, the constant comparative method^{27,28} was carried out. Comparison is conducted within and across interviews, going back and forth between codes, sub-categories, and categories to find similarities and differences. The analysis was discussed with researchers in home care nursing. Transferability was secured by intense description including direct quotes from the participants in forming codes and categories. Data analysis was supervised by an expert in home care nursing research.

Results

Seven cases meeting the inclusion criteria were referred during the period approved for the study. Fifteen nurses in the care of seven technology-dependent children participated in the study: seven primary nurses from pediatric units (one nurse per child), two nurses from discharge coordinating sections (one for each facility), and six home care nurses (one case did not use home care nursing service). The length of the interviews ranged from 26 to 84 minutes. Table 1 provides the characteristics of the participants. Length of nursing experience of hospital primary nurses, nurse discharge coordinators and home care nurses ranged from 3–20 years, 11–over 21 years, and 6–over 21 years respectively. One nurse (home care nurse) was male, and fourteen were female. Table 2 provides the details of the seven technology-dependent children. Age of the children at discharge ranged from 1 year to 6 years, and duration of hospitalization ranged from 9 months to 4 years and 8 months. Three of them were dependent on mechanical ventilation, five had tracheostomy. All of them required either or both of oxygen therapy and/or suctioning. Six were dependent on tube feeding, one on parenteral nutrition.

Table 1 Characteristics of 15 participants stratified by nursing situations

	Hospital Primary Nurses (n=7)	Nurse Discharge Coordinators (n=2)	Home Care Nurses (n=6)
Nursing experience			
3–5 years	3	0	0
6–10 years	1	0	1
11–20 years	3	1	2
21+ years	0	1	3
Gender			
Male	0	0	1
Female	7	2	5

Table 2 Characteristics of the technology-dependent children

	A	B	C	D	E	F	G
Age	1 year 11 months	4 years 8 months	2 years	6 years	1 year	2 years 9 months	1 year 8 months
Diagnosis	Hypoxic-ischemic encephalopathy	Congenital malformation syndrome	Hypoxic-ischemic encephalopathy	Autonomic dystonia, Hypoganglionosis	Epilepsy	Congenital neuromuscular disease	Hypoxic-ischemic encephalopathy
Duration of hospitalization	9 months	4 years 8 months	2 years	4 years	1 year	2 years 9 months	1 year 8 months
Type of dependency	Mechanical ventilation	✓				✓	✓
	Tracheostomy	✓		✓		✓	✓
	Oxygen therapy		✓	✓	✓	✓	✓
	Suctioning	✓	✓	✓		✓	✓
	Tube feeding	✓	✓	✓		✓	✓
Parenteral nutrition				✓			
Number of siblings	2	1	1	none	none	1	2

Table 3 Details in a categorized nursing practice that supports the transition of technology-dependent children from hospital to home

Core categories	Categories	P	DC	H	Examples of Sub-categories
Sustaining the child's health condition and development	Assessing the child's condition and valid interventions	✓		✓	Determine if the child's condition is feasible for home care Judge the child's condition and make valid interventions as needed
	Facilitating the child's development	✓		✓	Create opportunities for moving around or going out Deal with the child in the same manner as normal children
Family assessment	Assessing family	✓	✓	✓	Assess the parents' feelings Assess the support system within the family
Emotional support for the parents	Staying in touch with parents' feelings	✓	✓	✓	Listen to parents Accept the parents' feelings
	Advocating for the parents	✓			Speak on behalf of the parents to other health care practitioners Convey the parents' feelings or cognition at the daily rounds
Supporting the parents' decision-making	Supporting the parents' decision-making	✓	✓		Refrain from actively making suggestions from nursing side Confirm both positive and negative aspects
	Facilitating the parents' management of child's health	✓		✓	Let the parents actually listen to the sound for determination Go through observation points with parents
Promoting parents' self-efficacy	Giving positive feedback to the parents			✓	Provide feedback on the positive results of child's health assessment to parents Accept and evaluate the parents' care
	Giving medical care guidance as part of child rearing	✓			Give medical care guidance to parents as part of child rearing Help the parents implement medical care during their visit
Helping parents imagine life with the child at home	Helping parents imagine life with the child at home	✓		✓	Share the image of 24-hour life at home with parents Provide information about other similar children who are cared for at home
	Respecting and monitoring the parents' way of care			✓	Respect the parents' way of care Carry out the care according to the parents' preference
Parent education	Training parents about medical care and devices	✓			Provide training to multiple members of the family Provide training using checklists
	Training parents about daily child care	✓			Provide training in bathing the child Provide training about how to position or carry the child
Providing education geared to the characteristics of parents	Providing education geared to the characteristics of parents	✓		✓	Do not compel an action when family member is reluctant; rather, suggest another way to deal with Devise educational methods that the family caregiver can understand
	Supporting use of respite care	✓		✓	Emphasize the importance of respite for the primary caregiver Support the family members' outings
Support for family members' daily life	Consultation on family life			✓	Listen to parents' worries about the siblings Listen to the family's description of their problems and think together
	Exploring methods feasible for home care	✓		✓	Suggest materials that cost less and are feasible for home use Adjust the care schedule to match the family's daily life
Arranging the home environment	Adjusting medical equipment/supplies	✓	✓		Make a tentative calculation of the amount of disposable supplies to be prescribed Talk with parents to determine the amount of supplies feasible for the child's condition
	Assessing and adjusting home environment	✓	✓	✓	Visit the child's home prior to discharge Talk a lot with parents about where and how to arrange the medical equipment
Arrangements for social resources and multidisciplinary support	Supporting social resource utilization	✓	✓	✓	Provide information regarding social resources within the scope of own knowledge Explain the resources for home care and applications for those resources
	Clarifying the role of the hospital after discharge	✓	✓		Clarify who, how, and to where to contact an appropriate person in case of critical condition Clarify the contact person or division to consult after discharge
	Searching for community-based information		✓	✓	Look for home care nursing agencies that accept pediatric patients in the community Ask public health nurse about available services of the municipality
	Mediating for official applications		✓		Search for information regarding how to successfully apply for resources Consult with responsible division of the municipal office in advance
	Assuming the role of contact person inside and outside of the hospital		✓		Adjust the schedule of discharge meetings Adjust the schedule of meetings with home care nurses
	Contacting other health care practitioners	✓	✓	✓	Exchange information at multidisciplinary meetings Learn about rehabilitation from physical therapists
Discussion with parents	Making opportunities of discussion with parents	✓	✓	✓	Determine after discussing with parents Provide timely responses to questions asked

P: Hospital primary nurse DC: Nurse discharge coordinator H: home care nurse

As a result of qualitative descriptive analysis, 907 codes and 209 sub-categories were extracted. Then, 26 categories were created that represented the nursing practices for supporting the transition of technology-dependent children to home. These 26 categories were further classified into 9 core categories. Table 3 shows nursing practice for each of the three types of nurses.

1. Nursing practice over all

The core categories and most of the categories are addressed below. Herein, [] denotes a core category, < > a category, and “ ” a quotation.

[Sustaining the child's health condition and development]

This core category was derived from the hospital primary nurses and home care nurses. Both types of nurses determined if the child's condition was feasible for home care. Assessment and intervention for the child's health condition and development were performed. Two of the home care nurses stated as *“I go through checking his physical condition to see if anything has changed compared to that of the first home visit.”* Facilitation of the child's development during the transition was also considered.

[Family assessment]

It was derived from the nurses of all three settings. The family was assessed for the parents' feelings, the support system within the family, the parents' burden of care, impact on family life, sibling reactions, and the coping strategies of the family members. Examples of quotation were as *“We asked who could help the position change during the night.”* *“We found some discrepancy between mother and father in their feelings.”*

[Emotional support for the parents]

The nurses of all three settings demonstrated <staying in touch with parents' feelings>, by listening, accepting, and sympathizing. <Advocating for the parents> was demonstrated only by the hospital primary nurses. They advocated for the parents by speaking on behalf of the parents to other health care practitioners. A representative quotation of more than two nurses for this category was as follows: *“Parents seemed to hesitate to say some things to the doctor, so I told the doctor.”*

[Promoting parents' self-efficacy]

This core category consisted of five categories. <Facilitating the parents' management of child's health> was demonstrated by hospital primary nurses and home care nurses. It included educating the parents about health management, and instilling parental confidence about assessing and managing the child's health condition. The category <giving medi-

cal care guidance as part of child rearing> was demonstrated only by hospital primary nurses. The nurses began to train parents in medical care skills regardless of the certainty of discharge, to encourage the parents to participate in rearing their child. One nurse stated, *“I was thinking about things that the mother could do for her baby, whether the baby went home or not. I was sure that the baby was going to require long-term tube feeding, so I began to teach her how to tube-feed so that she could participate in rearing her child.”* <Giving positive feedback to the parents> was demonstrated only by home care nurses. Most of them focused on the good results in the child's health assessment and were <giving positive feedback to the parents> such as: *“I tell the mother that the child is doing OK based on physical assessment.”* *“I try to tell the mother how I determined that the child is all right by giving concrete examples of my observations.”* <Respect and monitor parents' way of care> was also demonstrated only by home care nurses which showed that they respected the parents' preferences regarding child care and monitored the parents' caregiving for efficacy and safety, rather than educating the parents. <Helping parents imagine life with child at home> was derived from the hospital primary nurses and nurse discharge coordinators. Three participants mentioned that they provided information about other similar children who are cared at home.

[Parent education]

<Training parents about medical care and devices>, and <training parents about daily child care> were derived from hospital primary nurses representing the hands-on training implemented during hospitalization, such as: *“We started training parents concretely and in details about the ventilator, cuff pressure, oral care and so on ...”* *“We let the parents try the same type of the equipment as planned to be used at home in advance.”*

[Support for family members' daily life]

As for <supporting the use of respite care>, the hospital primary nurses explained the importance of parents' respite; *“I told the mother that home care would last long so she had better have some time to get away, otherwise she would get overwhelmed and that might have negative impact on the child.”* The home care nurses actually supported the family members' outing by providing care; *“Home care nurse stays with her (the child) at home so that the mother can go out with the (child's) older sister during that time.”* <Consultation on family life> was demonstrated by the home care nurses alone. They listened to the parents about their daily life burdens or problems related to the child's siblings.

[Arranging the home environment]

⟨Exploring the methods feasible for home care⟩ was derived from hospital primary nurses and home care nurses. The hospital primary nurses talked with parents about adjusting the daily care schedule to match life at home represented by the quotation as “*I told that it might be troublesome besides housekeeping tasks to follow the time schedule of tube-feeding same with the hospital, so it might be changed,*” while the home care nurses introduced items that could be used at home instead of costly medical supplies. Furthermore, the hospital nurses and home care nurses went together and talked with the parents about such topics as how to bathe infants at home.

Both the hospital primary nurses and the nurse discharge coordinators were active in ⟨adjusting medical equipment/supplies⟩. The nurse discharge coordinator stated; “*I checked medical administration fees and made a tentative calculation for the amount of disposable supplies to be prescribed.*” The hospital primary nurse talked with the parents to ensure that the amount of supplies was appropriate for the child’s physical condition, and then made minor changes. For example, if the child tended to have excessive secretions from a tracheostomy, more pre-split gauze was required, while the amount of disposable syringes was decreased if nutrition or medication via nasogastric-tube was infrequent.

Some of the home care nurses visited the child’s home prior to discharge for ⟨assessment and adjustment of the home environment⟩. Asking parents to take pictures of the interior of their homes was one of the means of assessment used by hospital nurses. The hospital primary nurses talked with parents about where and how to arrange medical equipment and other items, or how they could transport the child.

[Arrangements for social resources and multidisciplinary support]

It consisted of six categories. As for ⟨support for social resource utilization⟩, all the nurses provided information regarding social resources within the scope of their own knowledge, but each type had a different approach. Hospital primary nurses were in the position to assess the needs of the family and asked the nurse discharge coordinators or social workers for relevant information, nurse discharge coordinators mainly described the resources that were available and how to access those resources, and home care nurses provided information about community resources. Nurse discharge coordinators tried to reduce parents’ task burden in addition to the child’s care by ⟨mediating for official applications⟩. One nurse stated, “*It is rather difficult to apply for the disability certificate when the handicapped child is under the age of one. So, I directly told the responsible municipal officer*

about the child, before the parents went there for application.”

Nurse discharge coordinators were ⟨assuming the role of contact person inside and outside of the hospital⟩ so that the information could be shared among those who were involved, and so that discharge meetings or other multidisciplinary rounds could be arranged as needed. ⟨Contacting other health care practitioners⟩ was demonstrated by all three types and referred to relationships with various practitioners in various settings, including nurses, physicians, therapists, pharmacists, social workers, outpatient clinics, clinics in the community, institutions providing respite care, emergency rooms, municipal offices, public health nurses, care workers, teachers, medical equipment vendors, and the fire department. Regarding the relationship with public health nurses who are also nursing professions, the nurses of all three settings provided information to the municipal public health nurses represented as follows; “*We sent the summary report to the municipal public health care center.*” “*We informed to the public health nurse in charge of the district that such a child is being prepared for discharge.*” No data were obtained in the interviews about reciprocal communication with public health nurses.

[Discussion with parents]

All nurses made opportunities of discussion with parents in all three settings. Representing Quotations are as; “*We provided several opportunities to discuss with parents in details.*” (A hospital primary nurse); “*I frequently visited the parents at the bedside and talked directly with them.*” (A nurse discharge coordinator); “*I made a visit to the hospital prior to discharge and met the parents to talk about visiting plans.*” (A home care nurse)

2. Overlaps and uniqueness of practice among the nurses of three settings

The identified categories of nursing practices are classified according to the types of the nurses in Figure 2, in order to present how these categories were common or specific to among the nurses of three settings. The overlap within the figure shows that the categories were common among the nurses of two or all three settings. The area “A” represents the practices derived from the nurses of all three settings which include six categories. Three categories were common in the hospital primary nurses and nurse discharge coordinators (B), seven were common in the hospital primary nurses and home care nurses (C), and one in nurse discharge coordinators and home care nurses (D). Four categories were derived from the hospital primary nurses alone; ⟨advocating for the parents⟩, ⟨giving

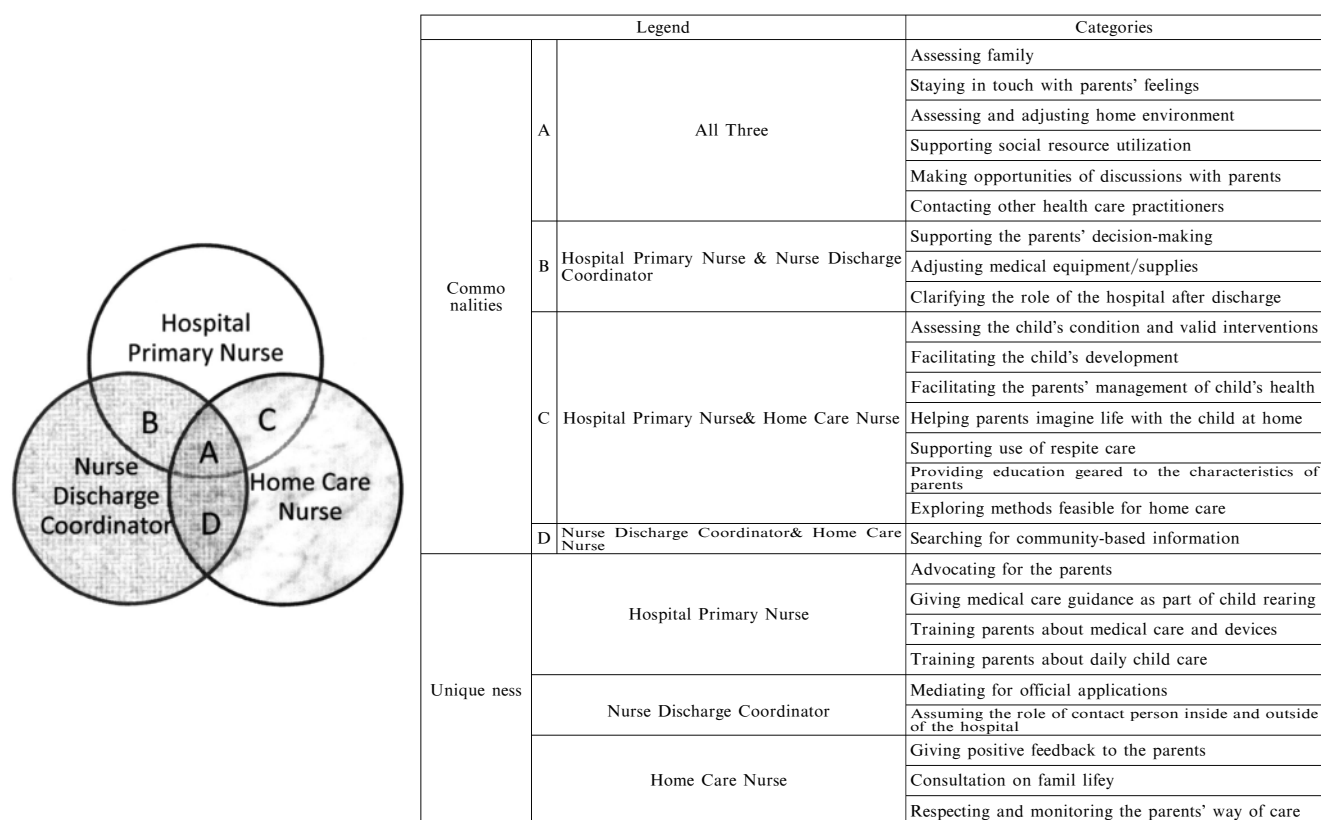


Fig. 2 Overlaps and uniqueness of supporting practice among the nurses working in three different settings

medical care guidance as part of child rearing>, <training parents about medical care and devices>, and <training parents about daily child care>. Two categories were derived from nurse discharge coordinators alone; <mediating for official applications> and <assuming the role of contact person inside and outside of the hospital>. Three categories were derived from home care nurses alone; <giving positive feedback to the parents>, <consultation on family life> and <respecting and monitoring the parents' way of care>.

Discussion

1. Commonalities and unique features of nursing practices

Nursing practices described by the participants concerning the transition of a technology-dependent child to home in the present study revealed nine core categories, including 26 salient categories. Most of the core categories are consistent with intervention processes reported in existing literature related to transition of a technology-dependent child to home.^{18,25,29,30} Promoting parents' self-efficacy has not been included in the intervention processes in existing literature. Furthermore, the present study adds the commonalities and unique features of practices among the nurses from three different settings.

Hospital primary nurses began training parents for medical care skills regardless of the certainty of dis-

charge, to encourage the parents to participate in rearing their child. Griffin et al.³¹ pointed out that parental participation in care is often minimal until discharge is imminent. Studies suggest that separation of parents from their infant poses many challenges to the development of the parent-infant relationship.^{30,31} Providing opportunities for parents to take care of their child in the early stages may contribute to facilitating the parent-infant relationship by allowing the parents to spend time with the child and fulfill the parental role. Griffin et al.³¹ also stated that when the focus of discharge planning is on post-discharge caregiving skills, it may inadvertently prevent parents from participating in infant care starting at the beginning of hospitalization. Yet, parents' confidence and ability to care for their infant at home can be strengthened throughout the infant's hospitalization by offering the parents training and opportunities to participate in caregiving activities.

Advocating for the parents was also one of the roles unique to hospital primary nurses. They communicated with the medical staff, especially physicians, about the parents' feelings or thoughts. Parents tend to feel unsure or conflicted during the decision-making process of choosing home care.²⁶ It is typical for parents to hesitate to show their feelings during this period. Kirk²¹ reported that parents of technology-dependent children placed high value on being able to

express their feelings and concerns. Hospital nurses, especially the primary nurses, become close to the parents; it is important for nurses to listen and advocate for parents to make the transition at the appropriate time.

Hospital primary nurses and home care nurses facilitated the parents' management of child's health by educating the parents about health management, and instilling parental confidence about assessing and managing the child's health condition. The fears commonly expressed by parents are inadequacy in recognizing signs of illness, or taking appropriate actions in case of an emergency.^{29,32} The hospital primary nurses used various strategies to enable the parents to gain those skills. Most home care nurses provided positive feedback to the parents about the child's physical condition. Feedback that the child is doing all right means that the parents are successfully caring for the child and this promotes parental confidence. These findings show how hospital nurses and home care nurses perform these roles and promote parents' self-efficacy relevant to home care of the technology-dependent child.

Nurse discharge coordinators assumed the role of mediation of official applications. Since the transition of technology-dependent children to the communities is rather new and not very frequent in one district, even the officers of municipal social welfare sections are not familiar with the details of social welfare services and systems,³³ and it is often difficult for the parents, who are lay persons, to declare their needs to the officer. Supporting the parents in official applications is an integral role of specialists for these populations. The role of contact person both inside and outside of the hospital was another key role of the nurse discharge coordinators.

Both the hospital primary nurses and the nurse discharge coordinators were active in helping parents obtain or secure medical equipment/supplies. The nurse discharge coordinator is more familiar with medical service systems, while the hospital primary nurse is more familiar with the individual child and parents. By collaborating, goals for the child and the parents are met. Thus, the present study was the first study that clarified the unique roles of the nurse discharge coordinators and their collaboration with the other two types of nurses in the transition of technology-dependent children.

Many roles were common for hospital primary nurses and home care nurses. The home care nurses were involved in the care not only after the child's discharge but also during the hospitalization. Such collaboration is integral for seamless support through the transitional stage. If the parents come to know the

home care nurses in advance, their anxieties toward home care may decrease because they receive care from nurses with whom they are familiar.

2. Possibilities of coordinating roles and collaboration

Seventeen of the categories were common among the nurses of two or all three settings. In some categories, each supported the children and their family in similar way. In other categories, such as facilitating the parents' management of child health, or adjusting medical equipment, each played the role differently to reach the goal. Recognizing his/her unique role and appreciating the roles that the other nurses perform in other settings would help the nurses to develop nurse-to-nurse collaboration. Findings of this study are considered to contribute as fundamental knowledge for development of nursing collaboration in supporting the transition of technology-dependent children to home.

The role of contact person both inside and outside of the hospital was one of the key roles of the nurse discharge coordinators. The nurse discharge coordinator is central to the multidisciplinary relationships and connects the hospital and the community. The role is important before and after the child is discharged in order to facilitate communication about the child's medical conditions.

Public health nurses are also the nursing professions considered as logical position to be included in the care team¹⁶ or even to be acting as coordinators.²⁴ In fact, public health nurses were designed to be included as participants in the present study at the beginning; however, case-based recruitment failed to include any public health nurses. Findings of the present study showed that no data were obtained in the interviews about reciprocal communication with public health nurses. It is strongly recommended to include public health nurses in the future research.

Study limitations and future perspectives

The study is considered to contribute to fundamental knowledge in an attempt to systematize the transition process for technology-dependent children and their families. Involvement of a more diverse sample would expand the generalizability of findings.

Conclusions

1. Commonalities and unique features of practice among the nurses from three different settings supporting the transition of technology-dependent children to home were clarified. The roles of the nurse discharge coordinators in dealing with technology-dependent children and their families

were newly reported.

- The nursing practices of each setting were identified. The findings of this study are expected to guide the nurses of each setting to recognize his/her unique role and to appreciate the roles that the other nurses perform in other settings which in turn would enable development of nurse-to-nurse collaboration in supporting the transition.

Acknowledgement

This research was funded by JSPS (Japan Society for the Promotion of Science) Grants-in-Aid for Scientific Research #17791652.

I would like to thank the nurses participated in this study for taking time to share their experiences. I would like to express my cordial thanks to Dr. Mitsu-ko Ushikubo, Gunma University Graduate School of Health Sciences, for supervising this paper.

References

- Oikawa I. Shoni manseishikkankanja no ryoyokankyo kojo ni mukete (Improving the condition of care for children with chronic diseases). *Shonihoken Kenkyu (The Journal of Child Health)* 2006 ; 65(1) : 5-10 (in Japanese).
- Tearl DK, Cox TJ, Hertzog JH. Hospital discharge of respiratory-technology-dependent children : Role of a dedicated respiratory care discharge coordinator. *Respiratory Care* 2006 ; 51(7) : 744-749.
- Boosfeld B, O'Toole M. Technology-dependent children : Transition from hospital to home. *Pediatric Nursing* 2000 ; 12(6) : 20-22.
- Narama M, Matsuoka M. Shoni zaitaku care guideline no nerai to katsuyo (Aims and applications of the pediatric home care guideline). *Komyunithi Kea (Community Care)* 2005 ; 7(1) : 40-45 (in Japanese).
- Daikoku T. Zaitaku ryoyo o keizoku suru kodomotachi no QOL o kangaeyo (Let us think about the QOL of children under home health care). *Shoni Kango (The Japanese Journal of Child Nursing)* 2003 ; 26(13) : 1807-1814 (in Japanese).
- Murphy G. The technology-dependent child at home part 1 : In whose best interest? *Pediatric Nursing* 2001 ; 13(7) : 14-18.
- Yoshino H, Yoshino M, Tanaka Y, et al. Shoni no zaitaku iryo no kadai to homon kangoshi eno kitai (Issues of home health care for children and possibilities of home care nurses). *Homonkango To Kaigo* 2006 ; 11(2) : 112-118 (in Japanese).
- Yamanishi N. Shoni no zaitakuryoyo ni okeru homonkango station no genjo to kadai (Current issues of home nursing agencies providing care for children). *Kodomo Iryo Center Igakushi* 2002 ; 31(4) : 50-53 (in Japanese).
- Aozasa K, Suzuki M, Takakura Y, et al. Zaitaku jinko kanki ryoho ni itaru kanji/kazoku eno enjo (Support for a child and the family for home mechanical ventilation). *Nihon Kangogakkai Ronbunshu Shoni Kango* 1994 ; 24 : 63-66 (in Japanese).
- Fleming JW. *Home Health Care for Children Who Are Technology Dependent*. New York : Springer Publishing Company, 2004.
- Storgion SA, Stutts AL. Transitional care : A multidisciplinary case management-based unit. *Pediatric Nursing* 2000 ; 26(6) : 564-568.
- Kelly A, Golnik A, Cady R. A medical home center : Specializing in the care of children with special health care needs of high intensity. *Maternal Child Health Journal* 2008 ; 12(5) : 633-640.
- Hagiwara K. Shoni kango ni okeru chiiki iryo renkei (Community health care systems in pediatric nursing). *Shoni Kango (The Japanese Journal of Child Nursing)* 2009 ; 32(1) : 9-13 (in Japanese).
- Yoshino H. Shoni zaitakuiryo to chiiki renkei (Pediatric home care medicine and community systems). *Chiryō (J Theap)* 2008 ; 90(3) : 1367-1371 (in Japanese).
- Sakurai I. Shoni zaitaku care o torimaku hoken, iryo, fukushi system (Health care, medical and welfare systems surrounding home health care for children). *Komyunithi Kea (Community Care)* 2005 ; 7(2) : 40-43 (in Japanese).
- Sawada K. Shoni homon kango ni hitsuyo na chishiki to gijutsu (Knowledge and skills required for home care nursing for children). *Homonkango To Kaigo* 2003 ; 8(5) : 366-372 (in Japanese)
- Ninomiya K, Konno M (eds). *Shonikangogaku Gairon (Introduction to Pediatric Nursing)*. Tokyo : Nankodo, 2009 (in Japanese).
- Oikawa I. Shoni no zaitaku ryoyo suishin no tame no care management program no shokai dai 1 kai (Introduction of the care management program for facilitating pediatric home care No.1). *Shoni Kango (The Japanese Journal of Child Nursing)* 2002 ; 25(11) : 1540-1557 (in Japanese).
- Narama M. Shoni zaitaku care ni okeru coordinator no yakuwari to network ka (Roles of coordinators and networking in pediatric home health care). *Komyunithi Kea (Community Care)* 2005 ; 7(14) : 30-33 (in Japanese).
- Tagawa K, Taneyoshi K, Suzuki M. Iryoteki-kea o hitsuyo tosuru kodomo no zaitakushien ni kansuru bunken kento (Literature review on support for home care of technology-dependent children). *Nihon Sekijūji Hiroshima Kangodaigaku Kiyō (The Japanese Red Cross Hiroshima Coll Nurs)* 2003 ; 3 : 61-68 (in Japanese).
- Kirk S, Glendinning C. Developing services to support parents caring for a technology-dependent child at home. *Child : Care, Health & Development* 2004 ; 30(3) : 209-218.
- Montagnino BA, McPherson ML, Hueckel R, et al. Home transition with a pediatric tracheostomy : Impediments to parental education and discharge. *Journal of Pediatric Nursing* 2006 ; 21(2) : 139.
- Forsythe P. New practices in the transitional care center improve outcomes for babies and their families. *Journal of Perinatology* 1998 ; 18(6) : S13-17.
- Sawada K, Oikawa I. Shoni no zaitaku ryoyo suishin no tame no care management program no shokai dai 2 kai (Introduction of the care management program for facilitating pediatric home care No.2). *Shoni Kango (The Japanese Journal of Child Nursing)* 2002 ; 25(13) : 1790-1801 (in Japanese).
- Japanese Society of Child Health Nursing "Sukoyaka-oyako 21" promoting committee (eds). *Kaitei-ban Kikansekkai o okonatte taiinsuru kodomo to kazoku eno care manual (Care Manual for the Children Discharged with Tracheostomy and Their Family-Revised-)*. Tokyo : Nihon shoni kango gakkai (Japanese Society of Child

- Health Nursing), 2003 (in Japanese).
26. Kanaizumi S. Nursing care supporting the transition of technology-dependent children to home (in Japanese). *Gunma Hokengaku Kiyo (Annals of Gunma University School of Health Sciences)* 2009; 30: 29-39 (Abstract in English).
 27. Greg M. (2007). Shitsuteki-kenkyu (Qualitative descriptive study). In: Greg M, Asahara K, Yokoyama M (eds). *Yokuwakaru Shitsuteki-Kenkyu no Matomekata*. Tokyo: Ishiyaku Shuppan, 2007: 54-72 (in Japanese)
 28. Chenitz WC, Swanson JM (eds). *From Practice to Grounded Theory: Qualitative Research in Nursing*. Menlo Park, CA: Addison-Wesley Publishing Company, 1986.
 29. Joseph RA. Tracheostomy in infants: Parent education for home care. *Neonatal Network* 2011; 30(4): 231-242.
 30. Just AC. Parent participation in care: Bridging the gap in the pediatric ICU. *Newborn and Infant Nursing Review* 2005; 5(4): 179-187.
 31. Griffin T, Abraham M. Transition to home from the newborn intensive care unit-Applying the principles of family-centered care to the discharge process. *Journal of Perinatal & Neonatal Nursing* 2006; 20(3): 243-249
 32. Takeda S. Kikansekkai o okonatte taiin suru kodomo to kazoku eno enjo (Helping the children discharged with tracheostomy and their family). *Shouni Kango (The Japanese Journal of Child Nursing)* 2004; 27(19): 1299-1305 (in Japanese).
 33. Yoshino H, Yoshino M, Tanaka Y, et al. The state and the system of home care medicine for children. *Shoni Geka (Japan Journal of Pediatric Surgery)* 2006; 38(9): 1086-1092 (Abstract in English).