ABSTRACT
Recently, kindergartens and nursery schools in Japan are facing a big problem: an increase in the number of children who require special care and attention. Caring for these children causes many problems for child nurses, especially if they are young and inexperienced. To resolve the above problem, first the present “no record” situation is analyzed through field research. We clarify that a paper format record cannot be utilized effectively in daily nurturing environments. Second, this paper proposes a new blog system called “Child Development Consulting Blog.” CDC-Blog is a communication platform for childcare professionals through which child nurses and visiting counselors mutually exchange messages.

KEY WORDS
Early childhood education, Nursery school, Kindergarten, Teacher, Weblog, Special needs children, Traveling counselling

1. Introduction

Recently, kindergartens and nursery schools in Japan are facing a big problem: an increase in the number of children who require special care and attention. These children are called special needs children. A child nurse with special needs children in class needs special knowledge to care for them. Unfortunately, this is usually not the case. Caring for these children causes many problems for child nurses, especially if they are young and inexperienced.

Corresponding to this situation, the Japanese Government has assigned a counsellor who usually travels and regularly visits each nursery school. After such visits, the counsellor observes the state of care and offers feedback and advice that child nurses act on. However, it is difficult for the counsellors to reserve enough time to talk with child nurses because the former are very busy and visit two or more nursery schools a day.

Child nurses are also very busy tending to children at nursery schools all day every weekday. Thus, the child nurse doesn’t have enough time to discuss the counselling results with colleagues. The child nurse tries to remember the counselling results without recording the content of counselling visits. This situation means that consulting results and advice are never shared among child nurses in nursery schools.

To resolve the above problem, first the present “no record” situation is analyzed through field research. We clarify that a paper format record cannot be utilized effectively in daily nurturing environments. Second, this paper proposes a new blog system called “Child Development Consulting Blog” (hereafter CDC-Blog). CDC-Blog is a communication platform for childcare professionals through which child nurses and visiting counsellors mutually exchange messages. All messages are stored and can be accessed by other specialists including head teachers, doctors, and psychotherapists with proper IDs and passwords. These stakeholders can share a child’s current situation, retrieve previous cases of a child’s care, and exchange advice for various problems. A prototype implementation of CDC-Blog has been developed and employed practically at a nursery school in Osaka.

The rest of this paper is organized as follows. Section 2 shows the research background, Section 3 describes field research at a nursery school, and Section 4 proposes a new blog system called CDC-Blog. Section 5 discusses evaluation results. Related works are discussed in Section 6. Finally, Section 7 concludes this paper.
2. Background

2.1 Tendency of Children
One major problem in Japanese nursery schools is how to provide the special care and attention required by special needs children. Such children have problems adapting to group life and building solid human relations. Figure 1 shows a classroom in a nursery school where most children are involved in arts and crafts. One child (masked for privacy) has special needs. The child nurse has been struggling with him for a long time. The other children are almost being neglected.

The Japanese or local governments have a system of infant medical examination that provides early detection and correspondence for special needs children. If the degree of emotional development delay or autism is severe, special needs child can be found in the early stages of development.

However, if the degree of development delay is less severe, as characterized by high functional autism and minor development delay, infant medical examinations often fail to detect special needs children. In such cases, the special needs child cannot receive appropriate special care. As a result, trouble often arises in nursery schools.

In older classes, a child nurse generally cares for about 10 to 20 children. Such classes have many different kinds of children. The child nurse must accurately grasp the personality and growth stage of each child to design the best care for each child. This is very hard, especially for nurses who have little nursery experience. The existence of a special needs child increases feelings and levels of stress.

3. Field Research on Traveling Counselling

First, to grasp the actual situation involving traveling counsellors, the authors did field research at some nursery schools in Osaka. One counsellor visits some nursery schools twice a month. The consulting time, which is set during such daily routines as nap time, is called a “conference” as shown in Figure 2. The conference time is insufficient for detailed discussion. Furthermore, accurate records of consulting contents are crucial to design nursery plans.

Our field research derived the following problems that must be resolved. Each problem will be described more concretely in the following subsections.

(Problem I) No written conference records
(Problem II) Difficulty of sharing paper format records among child nurses and the head teacher, even if written.
(Problem III) No communication between counsellors and child nurses between conferences.

Problem I: No written conference records
This problem arises from the busy schedules of child nurses. One or two nurses have difficulty caring for 20 to 30 children. Their break time coincides with nap times or after the children go home. But, since break time is also used to prepare for the next day, nurses cannot find time to record the previous conference. Due to this lack of records, child nurses and counsellors spend valuable conference time jogging their memories and reviewing the previous meeting. Their short and valuable time is wasted, and the counselling itself often depends on or reflects inaccurate memories.

Problem II: Limited information sharing by paper documents
Even if conference records are created, the paper format has some limitations. First, it is not suitable for information sharing among child nurses and head teachers. Since conference results are crucial for the future needs and care of special needs children, they should be discussed among child nurses. However, paper documents are not suitable for information sharing.

The child nurse creates a document for recording conference results at other nursery schools on a specially designed sheet called “Record of Development Counselling.” The child nurse writes the memo on a sheet that must be faxed or mailed to the counsellor. Since this sheet contains very private information, copying is
basically prohibited. Thus, other child nurses can’t access this sheet.

Problem III: Long intervals before next counselling
As mentioned above, the counselling interval is two weeks. Field research shows no interaction between child nurses and counsellors between counselling intervals. Since a special needs child’s situation often changes daily, child nurses must pay attention to grasp what triggered the change. If changes can be recorded immediately and child nurses can communicate with counsellors about changes, the child nurse might begin to have deep and detailed understanding. However, currently no daily communication exists between nurses and counsellors.

To resolve the above problems, this paper proposes a childcare supporting blog system: Child Development Counselling Blog (CDC-Blog). This system supports the traveling counsellor and provides a new counselling style.


4.1 Outline of Proposed System
Figure 3 shows an overview of the proposed CDC-Blog system that features a specially designed data input screen developed using Nucleus [2], PHP, and MySQL. Since user IDs and passwords are required to access the CDC-Blog system, only the head teacher, the child nurses, and the counsellor can access the system. Access protocols are HTTPS for security. A Weblog is created for each class in which only the nurse in charge and registered child nurse can write and update the class’s Weblog screen. Other child nurses can read the contents of other child nurse’s Weblogs, but cannot modify the contents. Counsellors and head teachers can access and modify all Weblog contents.

To support simple uploading of messages from counsellors and child nurses, we designed a message template, as mentioned below. This template has predefined fields filled in by participants. Using these data fields, the system automatically generates counselling records. All participants can check the content of the counselling records. One thread in the blog is assigned to one topic (problem). When problems are resolved, the corresponding thread is removed and stored in a database.

4.2 Counselling procedure using CDC-Blogs
The following is the counselling procedure using a CDC-Blog.

STEP I: Conferences at nursery schools
The counsellor usually travels and regularly visits nursery schools. When visiting a nursery school, she/he observes the state of care provided and offers help and advice.

STEP II: Remembering by the child nurse
The child nurse creates a counselling report and acts on the advice offered by the counselling specialist. This memorandum is shared on the CDC-Blog among child nurses and counsellors.

STEP III: Remembering by counsellors
Counsellors read the reports created by child nurses through the CDC-Blog system and add comments. Messages can be accessed by child nurses. Notice that the above STEP II and this STEP III can be repeated between on-site counselling sessions, two weeks in the field research. If the child nurse recognizes new behavior of the special needs child, a message can immediately be written for the counsellor who can reply to it. Therefore pseudo real-time communication exists between child nurses and counsellors using the CDC-Blog system.

STEP IV: Information sharing among stakeholders
All processes and documents are shared through the CDC-Blog among the stakeholders: the child nurse, the head teacher, and the counsellor. The head teacher can easily grasp and analyze the entire care situation for special needs children at his/her kindergarten or nursery.

STEP V: Subsequent counselling at the nursery school
After CDC-Blog communication, the counsellor visits the school and has a conference where the child nurse and the counsellor easily confirm the past.
4.3 Major Features of the CDC-Blog System

The following are the four major features of the proposed system:

(1) Newly Designed and Simplified Input Template
As mentioned above, there is a specially designed format for counselling records in a paper format. Conventional Weblog input formats are much different than conventional paper-based sheets. Thus, a new input template for data input was designed, as shown in Figure 4, based on conventional paper-based sheets. In the first prototype system, the number of input data entries was 13. However, as mentioned below, the number was decreased to ten for quicker data input. In Figure 4, the screen has 10 data input items, since the date counted as three items. When the “submit” button is pushed, the input data are uploaded into the server machine and the blog screen is updated, as shown in Figure 5. In Figure 5 some data are masked for privacy issues.

(2) Easy Communication between Nurses and Counsellors
Since CDC-Blog is a blog system, nurses and counsellors can write comments like conventional blogs. Figure 6 shows the communication results between a counsellor and a nurse. Usually, older nurses and head teachers are not familiar with computer technology. However, since most young nurses are very familiar with blogs and using browsers such as Internet Explorer (IE), they can use the CDC-Blog system without needing to learn new computer technology.

(3) Printing Paper-based Forms
The contents of each conference should be filed in a paper-format. Thus, this CDC-Blog system can print specially designed paper forms to record the conference and communication between nurses and counsellors.

(4) Information Sharing among Stakeholders
Figure 7 shows the top screen of a CDC-Blog system that has six classes. The nurses and the head teacher can read every blog. This means that all information concerning special needs children can be shared in the nursery school. If a new comment or record is added to the blog, a “news” headline appears in the top screen. Thus, the nurses and head teacher can detect input data.
The authors developed the first CDC-blog prototype for user interface evaluation by an Osaka nursery school. The school details include: 1) six classes, 2) a total of about 100 children, and 3) system users comprised of one head teacher, nine nurses, and one counsellor. The authors made a hearing from the users from which a list of all children with special needs (Figure 8) was added, and the number of data items for the conference record was decreased to ten (Figure 4).

5. Experimental Evaluation

A field test of the implemented prototype system started in May 2006 at an Osaka nursery school. The system is now available for communication between nursery schools and visiting counsellors. After being used for two months in an actual nursery, the authors met with the nursery school staff. The following are the interview results.

(1) Frequency of Records and Comments
100% of the records of each conference are recorded by the CDC-Blog. After making an initial conference record, 19 inputted comments were made over the next two months. On the other hand, in conventional visiting conferences no record is made, and there is no communication in the two-week interval between conferences, because the head teacher, who is also the owner of the nursery school, ordered the nurses to make records and comments. Such an “order” is required to utilize the new information system.

(2) Difficulty of Writing Comments
Our interviews uncovered an interesting fact: counsellors have difficulty writing comments. They usually spend about 20 minutes writing one comment and repeatedly modifying it because they are afraid that written sentences might cause misunderstanding. The comments, recorded by the system, can be read by all stakeholders many times. This is one reason that counsellors spend much time on the comments. In face-to-face conferences, tone of voice and speaking manner convey a wealth of information. But blog communication provides no such information. Thus, rewriting for the clear presentation of vital information sometimes adds pressure to counsellors.

(3) Advantage of the Longtime Use of CDC-Blog
The most impressive opinion of the nurses at our interviews was that the longtime use of CDC-Blog results in good “follow-up” after actual conferences. The number of actual conferences reflects local governments, ranging from once to twice a year. If the number of face-face conferences is small, we believe that CDC-Blog can be an effective tool to follow the advancement of special needs children.

Of course, this CDC-Blog is a support system for visiting counsellors. In the current prototype version, nurses cannot upload photographs and digital movies, even though both are very effective media to observe special needs children. We are currently developing the next prototype system that allows users to upload movies or photographs.

The protection of privacy is another major issue for CDC-Blog implementation. As mentioned above, https protocols and user passwords are employed by the prototype system. The child’s real name is camouflaged by a nickname. Even if the password is broken, the child’s real name is not revealed. Also, since the authors consider photographs and digital movies to be the most critical private information, modification of real photographs or movies is required.

6. Related Works

A blog system is essentially a communication tool. Thus, it is not rare to use a blog system for communication concerning child development. For instance, “E-mama” [7] is a communication site for raising children. The huge, well-known “Rakuten” site has many prenatal or childcare blogs. These conventional systems are just blog systems for general use that anyone can join. The users never include private information and the reliability of blog content is not high.

On the other hand, the proposed CDC-Blog is not a blog system for general use. It has specially designed user interfaces. The initial conference data input screen and the list of children are designed for child development consulting. CDC-Blog has a database of registered children, names, birthdays, gender, class name, etc. Also the system can output a PDF as a paper format. These specifications show that the proposed system is not a blog system but rather an application system.

The authors have already proposed a “Diary Blog System” [6] for an education practice course of university students. This blog system, which was specially designed for communication between students who are student-teaching and university teachers, is also an application system customized from a general use blog system. The system’s functions are quite different from the proposed CDC-Blog.

7. Conclusion

A childcare support blog system, CDC-Blog: Child Development Consulting Blog, has been proposed and implemented. The system is available at an actual nursery school in Osaka. Two months after the start of the experiment, the authors evaluated the CDC-Blog by interviewing the nursery school staff.

The following list reflects the opinions of the nursery school’s head teacher:

(1) Keeping records of visiting counseling and commenting on the CDC-Blog should be incorporated into the daily routines of nurses.
(2) He could grasp the entire situation concerning childcare for special needs children.
(3) Order making was simplified so that the head teacher could recognize the entire situation. The stress on the nurse caring for a special care child could be shared among all members of the school.

By using this blog system, we collected many actual child-care cases. Since anyone can access the case database and retrieve appropriate advice, our blog can be considered a child-care knowledge database. We are now planning the automatic extraction of “frequently asked child-care questions” (FAQ) from this knowledge database. For this reason, digitalizing nursery records offers many advantages.

Finally, the authors concluded that this CDC-Blog system very effectively shares information concerning special needs children in nursery schools. Using the system helps distribute the high stress felt by child nurses among all staff members and counsellors.

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