

Original Paper

# Evaluation of an Easy-to-read Pamphlet on Contraception for Postpartum Couples with Intellectual Disabilities

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## Abstract

This study aimed to evaluate an easy-to-read instructional pamphlet on contraception for postpartum couples with intellectual disabilities (ID). This study used a quasi-experimental, one-group pre-and post-test design before and after reading the pamphlet. We devised the pamphlet following the "Guidelines for Providing Easy-to-read Information to People with ID" and by adopting easy-to-read illustrations based on Lättläst (LL) manga. The text and illustrations in the pamphlet were evaluated from the perspective of comprehensibility and readability. Data were collected from a purposeful sample of 23 participants using self-administered questionnaires before and after reading the pamphlet. Improved patterns between pre-test and post-test answers ("unknown-correct" and "incorrect-correct") were observed in 14 out of a total of 15 questions. The frequency rate of improved answer patterns other than "correct-correct" ranged from 0% to 58.8%, with a mean of 34.7%. The highest rate of improvement was found for the question "What should you keep in mind when taking a contraceptive pill?" (58.8%) followed by "Choose the picture of an intrauterine device/intrauterine system." (50.0%), and "When should you start contraception after childbirth?" (45.5%). Almost 74% of the participants indicated that both the illustrations and text were "good." The reasons for satisfaction were clear, large manga illustrations with large print as well as Chinese characters accompanied by kana characters. Nevertheless, 13% and 17.4% of the participants indicated that the illustrations and text were "bad," respectively. The main reason for the negative evaluation of the text was "The letters were too small." We concluded that the illustrations and text were sufficient and useful in terms of readability; however, further improvements might be needed regarding comprehensibility.

## 1. Introduction

Sexual and reproductive health and rights are human rights. This implies that everyone has the right to control their bodies and decide freely and responsibly if, with whom, and how many children to have<sup>1,2)</sup>. These rights also include guaranteeing the possibility of having pleasurable and safe sexual experiences<sup>1,2)</sup>. Sexual and reproductive health and rights depend on several factors, one of which is access

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to comprehensive, good-quality information about sex and sexuality<sup>1,2)</sup>. Since the Act for Eliminating Discrimination against Persons with Disabilities was enforced in 2016, various measures have been undertaken to establish an inclusive society in Japan. Even so, very few serious attempts have been made to guarantee the rights of people with intellectual disabilities (ID). Sugiura and Oki interviewed healthcare and welfare professionals caring for puerperal mothers with ID<sup>3)</sup> and revealed that people with ID had difficulty comprehending family planning and choosing and using contraceptives<sup>3)</sup>. So far in Japan, little attention has been given to this topic. Part of the reason is that until 1996 in Japan, the Eugenic Protection Law legalized the sterilization of people with ID, mental disorders, or hereditary diseases to prevent births of what were viewed as "inferior" progeny. Victims brought a lawsuit against the Japanese government for compensation and an official apology was provided in 2017. Over the last few years, the number of studies and articles on the sexual and reproductive health and rights of people with ID has increased. Still, what seems to be lacking is a practical study in healthcare settings to give security to sexual and reproductive health and rights. This study will accordingly, it is hoped, contribute to guaranteeing sexual and reproductive health and rights of people with ID.

## 2. Background

### *2.1 Necessity of a pamphlet on contraception for people with ID*

The Diagnostic and Statistical Manual of Mental Disorders (DSM-5) defines ID as neurodevelopmental disorders that begin in childhood, and characterizes ID as difficulties in conceptual, social, and practical areas of living<sup>4)</sup>. The DSM-5 diagnosis of ID requires the satisfaction of deficits in intellectual functioning, which refers to reasoning, problem-solving, planning, abstract thinking, judgment, academic learning, and learning from experience<sup>4)</sup>. Implementation of contraception requires intellectual ability and can be difficult for persons with ID. There are several contraceptive methods available, and users have to select an appropriate method for themselves while considering the advantages and disadvantages of those methods. Also, abstract expressions are often used; for instance, the failure probability of each contraceptive is often indicated as a rate. Moreover, assumptions are presented when information on how to select a contraceptive is provided. Similarly, specific physical conditions are required for the use of some methods; for example, combined estrogen-progestin oral contraceptives cannot be prescribed to heavy smokers, and intrauterine devices (IUDs) cannot be applied to those with a retroflexed uterus. To contribute to overcoming these difficulties, the present researchers devised the pamphlet in this study.

### *2.2 A pamphlet using illustrations based on *Lättläst (LL)* manga*

Today, manga is very popular worldwide. In Japan, a tremendous number of educational comic books have been published targeting every generation, not only those of school age. Specific techniques have been developed so far, such as the typical manga symbols (*manpu*) that symbolize a character's emotions or status visually, metaphoric expressions, or layered pictures, and it is said that manga has been evolving to meet the needs of various audiences. Yoshimura remarked that manga is not easy for everyone to read, and there is a so-called "manga literacy."<sup>5)</sup> Accordingly, he and his colleagues proposed the development of manga that everyone can easily read<sup>5,6)</sup>.

## 3. Objective

The objective of this study was to evaluate an educational pamphlet on contraception for persons with ID.

### *3.1 Research questions*

This study aimed to answer the following research questions: (i) Do the explanations in the educational pamphlet on contraception for people with ID have a positive effect on their knowledge?, (ii) Is there relevance between questionnaire results before and after reading the pamphlet on contraception and participants' demographic variables (level of ID, sex, and having/not having a child)?, and (iii) How do participants perceive the educational pamphlet's comprehensibility and readability?

## 4. Methods

### 4.1 Research design, participants, and procedure

This study used an interventional one-group pre-test-post-test design, before and after reading the educational material devised by the present researchers. A pre-test and post-test questionnaire measured changes in knowledge about contraceptives. The procedure was as follows. First, we explained the study to the administrators at two social welfare service facilities and obtained their consent to conduct the study. We then presented the criteria for selecting participants to the administrators, who explained the study to care staff in charge of persons with ID and obtained their consent to cooperate in the study. Then, the staff explained the study's purpose and methods to eligible participants, and obtained their consent before the investigation began. Inclusion criteria were being an adult, possession of a passbook for moderate-mild ID, and marital life experience.

### 4.2 Data collection

Data were collected from March to June 2020. The whole process consisted of obtaining written consent, a pre-test questionnaire, reading the pamphlet, and a post-test questionnaire, in that order. Care staff familiar with the participants provided help reading text in the questionnaires or the pamphlet, if necessary. In addition, the care staff filled in the questionnaire on behalf of the participants who required such assistance. The duration of the whole process from the pre-test to post-test ranged from 20-60 min.

### 4.3 The pamphlet on contraception

In this study, we devised a 20-page pamphlet on contraception, which consisted of two parts. The first part contained an LL manga (11 pages), and the second part contained text explanations following the "Guidelines for Providing Easy-to-read Information to People with Intellectual Disabilities" (Table 1) and easy-to-read illustrations based on LL manga following the "Guidelines for Creating LL Manga" (eight pages)<sup>7</sup>. The other two pages comprised the front and back covers.

The illustrations were drawn by an LL manga artist. The present paper describes the investigation of the second part of the pamphlet. The contents of the second part had initially consisted of the following information: (i) From when can a couple start having sex after childbirth? (ii) What kind of contraceptives can a postpartum couple use? (iii) How to use a male condom, (iv) How to take contraceptive pills, (v) How to use IUD/intrauterine system (IUS), (vi) Is the information on the Internet about contraceptives correct or incorrect? and (vii) Whom should you consult about contraception? We examined the participants' knowledge about those contents before and after reading the pamphlet in this study.

### 4.4 Questionnaire

The pre-test and post-test questionnaire to measure participants' comprehension comprised four sections. The first section contained a socio-demographic data sheet developed by the researchers. The collected demographics were age, sex, type of ID passbook, having/not having a child, and pregnancy experience (for females only). The second section measured participants' knowledge about contraception before reading the pamphlet. The third section contained the same questions as the second section to examine participants' knowledge about contraception after reading the pamphlet. Twelve of the total 15 pre-test and post-test questions had four response choices, including "I do not know." For the remaining three questions, participants were asked to draw a line to connect words and a matching picture. The fourth section sought participants' evaluations regarding the readability and comprehensibility by choosing an answer from three choices (good, moderate, and bad). The reason for providing those responses were obtained through an open-ended question.

### 4.5 Analysis

Descriptive statistics were utilized to describe frequencies, means, and standard deviations of the participant demographic characteristics and study variables. For the core analysis, changes between pre-test and post-test answers were examined; there were nine combinations of pre-test to post-test answers, including "incorrect-correct" and "unknown-correct." Fisher's exact test was used to examine the association

Table 1 Guidelines for providing easy-to-read information to people with intellectual disabilities (ID)

Contents
<p>1. Write concretely.</p> <ul style="list-style-type: none"> <li>• Do not use difficult words.</li> <li>• Do not use more than four consecutive Kanji character words or abstract concepts, except common sayings.</li> <li>• When providing new information, explain the background and premises.</li> <li>• Delete unnecessary words and expressions as much as possible.</li> <li>• Even though a word may be prevalent, any information about the word necessary for people with ID to understand should be included.</li> </ul> <p>2. Do not use complex expressions.</p> <ul style="list-style-type: none"> <li>• Do not use metaphors, allegories or personification.</li> <li>• Do not use double negatives.</li> <li>• Do not use a lot of substitutes.</li> <li>• Use consistent words and terms to describe the same things.</li> </ul> <p>3. Write in clear sentences.</p> <ul style="list-style-type: none"> <li>• Present the most important information at the beginning.</li> <li>• Describe one topic per sentence.</li> <li>• Number and itemize the contents sequentially.</li> <li>• Write in chronological order.</li> <li>• Do not use conjunctions, if possible.</li> <li>• Do not omit the subject.</li> </ul> <p>4. Transcription</p> <ul style="list-style-type: none"> <li>• Write from left to right.</li> <li>• Each sentence should have less than 30 characters.</li> <li>• Write common sayings using the same language as they are spoken.</li> <li>• Use kanji characters for a third grade level, except for common sayings.</li> <li>• Do not use unfamiliar words of foreign origin.</li> <li>• Do not use Chinese numerals.</li> <li>• Do not use the 24-hour clock to convey the time. Instead, use AM for morning and PM for afternoon.</li> <li>• Use clear style (Gothic) print that is easy to see.</li> <li>• Use a font size of more than 12 points.</li> </ul> <p>5. Layout</p> <ul style="list-style-type: none"> <li>• When you use Kanji characters, add kana above it with a font size approximately half that of the Kanji characters.</li> <li>• Insert pictures, photographs, or pictograms with additional information to help people with ID understand the meaning.</li> <li>• For a brochure or book, show one topic over two pages, if possible.</li> <li>• Insert a space between words and units of measurement.</li> <li>• Start a new line for each new topic.</li> <li>• Leave space between lines.</li> <li>• Explain terms and concepts in the page margin, if necessary.</li> <li>• To emphasize vital concepts and keywords, use classification by color, bold text, or boxes.</li> </ul> <p>6. How to convey information</p> <ul style="list-style-type: none"> <li>• Supplement information orally when using paper-based material.</li> </ul> <p>7. Other points of attention</p> <ul style="list-style-type: none"> <li>• Consider the characteristics of individuals with ID.</li> <li>• Use language appropriate for the age of the target audience.</li> </ul>

The original guidelines in Japanese were translated by the author of this article.

ID: intellectual disabilities

between participant demographic characteristics and pre-test to post-test answer patterns. The test considered a two-sided significance level of  $p < 0.05$ . IBM SPSS version 20.0 was used for the statistical analysis. In addition, open-ended responses were categorized by content and grouped by similarity.

#### 4.6 Ethical considerations

Ethical approval was obtained from the research ethics committee of Nagoya Women's University (ref. no. 2019-12). Written, informed consent was obtained from all participants after explaining the purpose and the nature of the study. Participants were notified that participation in the study was voluntary and that they had the right to decline participation and withdraw from the study without penalties. They were also notified that the study contained no direct benefits or compensation for participation, but they could benefit by gaining knowledge about contraception.

## 5. Results

### 5.1 Demographic characteristics of participants

The participants' demographic characteristics are shown in Table 2. Twenty-three people who met the

Variables	n	%
Gender		
Male	12	52.2
Female	11	47.8
Age, years (mean $\pm$ SD)	42.1 $\pm$ 1.6 (range: 24-64)	
Age of males, years (mean $\pm$ SD)	44.3 $\pm$ 9.5 (range: 33-64)	
20s	0	0.0
30s	4	33.3
40s	6	50.0
50s	1	8.3
60s	1	8.3
Age of females, years (mean $\pm$ SD)	39.2 $\pm$ 10.2 (range: 24-58)	
20s	2	18.2
30s	5	45.5
40s	2	18.2
50s	2	18.2
Type of passbook for people with ID		
B1 (Moderate) total	7	30.4
Male	3	
Female	4	
B2 (Mild) total	16	69.6
Male	9	
Female	7	
Number of children		
0 total	15	65.2
Male	8	
Female	7	
1 total	8	34.8
Male	4	
Female	4	
Experience of pregnancy (females only)		
No	6	54.5
Yes	5	45.5

ID: intellectual disabilities

inclusion criteria participated in this study. Twenty-two of the 23 participants comprised 11 couples. There were 12 male participants (52.2%), and 11 female participants (47.8%). The ages of the entire sample ranged from 24 to 64 years (males: 33 to 64 years, females: 24 to 58 years) with a mean age of  $41.9 \pm 10.0$  years (males:  $44.3 \pm 9.5$  years, females:  $39.2 \pm 10.2$  years). The majority of male participants were in their 40s, and the majority of female participants were in their 30s. According to the type of passbook, 69.6% of the participants had a mild level of ID, and 30.4% had a moderate level of ID. Four participants who comprised two couples, had a child. One female had experienced pregnancy but did not have any children. The type of passbook reflects the level of ID. Almost 70% accounted for B1 (moderate level), and more than 30% accounted for B2 (mild level).

## 5.2 Change between pre-test and post-test answers

### 5.2.1 Answer frequency

Table 3 shows the answer frequencies for the nine patterns of before-after answers for each question. In 13 out of the 15 questions, more than 60% of participants answered correctly on the post-test. The highest frequency rate was for "Choose the picture of a male condom" (95.7%), followed by "Choose the picture of an IUD/IUS," and "Whom should you consult about contraception?" (both 91.3%), and then "Is it ok to touch a male condom with oily hands?" (87.0%). To assess the effects of the pamphlet, it would seem sensible to look at the two "improved" patterns ("unknown-correct" and "incorrect-correct"), which are shown in Table 3. It is also worth paying attention to the frequency rate of "improved" patterns other than the "correct-correct" pattern. The highest "improved" frequency rate was found for the question "What should you keep in mind when taking a contraceptive pill?" (58.8%), which was followed by "Choose the picture of a male condom" (50.0%), "When should you start contraception after childbirth?" and "Is it correct to put on two male condoms?" (both 44.4%).

### 5.2.2 Association between pre-post answer patterns and demographic variables

The results of Fisher's exact test indicated that there was no significant association between the improved response patterns and the level of ID or sex. However, for three questions ("Is it correct to put on two male condoms?", "Is putting on a male condom at the beginning of sexual intercourse correct?", and "Is there much incorrect information regarding contraception on the Internet?"), correct post-test answers were significantly related to having/not having a child. Participants who had a child showed a higher frequency of correct post-test answers than those without a child (Table 4).

### 5.2.3 Participants' evaluation of the illustrations and text

Table 5 presents the participants' evaluation of the comprehensibility and readability of the illustrations and text and their reasons. Almost 74% of the participants indicated that both the illustrations and text were "good". Some of the reasons for this evaluation were clear, large manga illustrations with sufficiently large text, as well as Chinese characters accompanied by kana characters. Nevertheless, 13% and 17.4% of the participants indicated that the illustrations and the text were "bad," respectively. An example reason for the negative evaluation of the illustrations was "Photographs would be preferable to depict the contraceptives." The most common reason for the negative evaluation of the text was "The letters in the text were too small."

## 6. Discussion

The frequency of the "improved" response patterns between the pre-test and post-test, excluding "correct-correct," ranged from 0 (0%) to 10 (58.8%). This indicated that the pamphlet failed to provide sufficient comprehensibility. However, because of the small number of respondents, further study is needed.

On the other hand, the participants highly evaluated the illustrations and text. In this investigation, participants were asked to read through all the pamphlet contents in one sitting, which might have been demanding. The 20-page pamphlet consisted of eleven pages of an LL manga, eight pages of explanations on contraception with illustrations and text, and the front and back covers.

The time spent to complete the entire investigation process ranged from 20-60 min, although we did not

Table 3 Nine frequency patterns for pre-test and post-test answers

Questions	Before-after										n (%) (N=23)
	Correct answer on post-test					Unknown and incorrect answer on post-test					
	Subtotal <sup>†1)</sup> 17.1 ±3.7 (74.5)	Correct- correct	Unknown- correct (improved patterns)	Incorrect- correct	Subtotal <sup>†2)</sup> 3.4 ±2.6 (34.7)	Unknown- unknown	Incorrect- incorrect	Incorrect- unknown	Unknown- incorrect	Correct- unknown	
Q1. What is contraception?	17 (73.9)	16 (69.6)	1 (4.3)	0 (0.0)	1 (14.3)	4 (17.4)	2 (8.7)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Q2. When should you start contraception after childbirth?	11 (47.8)	6 (26.0)	4 (17.4)	1 (4.3)	5 (45.5)	0 (0.0)	1 (4.3)	0 (0.0)	3 (13.0)	0 (0.0)	2 (8.7)
Q3. Choose the picture of a male condom.	22 (95.7)	22 (95.7)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (4.3)	0 (0.0)
Q4. Choose the picture of contraceptive pills.	19 (82.6)	17 (73.9)	2 (8.7)	0 (0.0)	2 (33.3)	4 (17.4)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Q5. Choose the picture of an IUD/IUS.	21 (91.3)	17 (73.9)	2 (8.7)	2 (8.7)	4 (50.0)	4 (17.4)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Q6. Is it correct to put on two male condoms?	18 (78.3)	14 (60.9)	3 (13.0)	1 (4.3)	4 (44.4)	4 (17.4)	1 (4.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Q7. Is it ok to touch a male condom with oily hands?	20 (87.0)	18 (78.3)	2 (8.7)	0 (0.0)	2 (40.0)	3 (13.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Q8. Is putting on a male condom at the beginning of sexual intercourse correct?	16 (69.6)	11 (47.8)	4 (17.4)	1 (4.3)	5 (41.7)	5 (21.7)	2 (8.7)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Q9. Is it ok to pinch a male condom with your fingernails?	19 (82.6)	16 (69.6)	3 (13.0)	0 (0.0)	3 (42.9)	4 (17.4)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Q10. Who takes contraceptive pills?	16 (69.6)	14 (60.9)	2 (8.7)	0 (0.0)	2 (22.2)	4 (17.4)	2 (8.7)	1 (4.3)	0 (0.0)	0 (0.0)	0 (0.0)
Q11. Where do you obtain contraceptive pills?	18 (78.3)	15 (65.2)	3 (13.0)	0 (0.0)	3 (37.5)	3 (13.0)	0 (0.0)	1 (4.3)	1 (4.3)	0 (0.0)	0 (0.0)
Q12. What should you keep in mind when taking a contraceptive pill?	16 (69.6)	5 (21.7)	10 (43.5)	1 (4.3)	10 (58.8)	7 (30.4)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Q13. Is an IUD/IUS more effective than a male condom?	14 (60.9)	7 (30.4)	7 (30.4)	0 (0.0)	7 (43.8)	6 (26.1)	2 (8.7)	0 (0.0)	1 (4.3)	0 (0.0)	0 (0.0)
Q14. Is there much incorrect information regarding contraception on the Internet?	9 (39.1)	7 (30.4)	2 (8.7)	0 (0.0)	2 (12.5)	8 (34.8)	0 (0.0)	0 (0.0)	3 (13.0)	0 (0.0)	3 (13.0)
Q15. Whom should you consult about contraception?	21 (91.3)	20 (87.0)	1 (4.3)	0 (0.0)	1 (33.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (8.7)	0 (0.0)

<sup>†1)</sup> The frequency rate is the subtotal of correct answers on the post-test for all 23 participants.

<sup>†2)</sup> The frequency rate is the subtotal of improved answer patterns per unknown and incorrect answer on the pre-test.

Table 4 Association between correct post-test answers and having a child n (%) (N=23)

Questions	Have a child (n=8)	Do not have a child (n=15)	P-value
Q1. What is contraception?	8 (100.0)	8 (53.3)	0.052
Q2. When should you start contraception after childbirth?	2 ( 25.0)	4 (26.7)	1.000
Q3. Choose the picture of a male condom.	8 (100.0)	14 (93.3)	1.000
Q4. Choose the picture of contraceptive pills.	8 (100.0)	9 (60.0)	0.058
Q5. Choose the picture of an IUD/IUS.	8 (100.0)	8 (53.3)	0.051
Q6. Is it correct to put on two male condoms?	8 (100.0)	6 (40.0)	0.007
Q7. Is it ok to touch a male condom with oily hands?	7 ( 87.5)	10 (66.7)	0.114
Q8. Is putting on a male condom at the beginning of sexual intercourse correct?	6 ( 75.0)	4 (26.7)	0.020
Q9. Is it ok to pinch a male condom with your fingernails?	8 (100.0)	8 (53.3)	0.052
Q10. Who takes contraceptive pills?	7 ( 87.5)	7 (46.7)	0.086
Q11. Where do you obtain contraceptive pills?	8 (100.0)	7 (46.7)	0.176
Q12. What should you keep in mind when taking a contraceptive pill?	2 ( 25.0)	3 (20.0)	1.000
Q13. Is an IUD/IUS more effective than a male condom?	1 ( 12.5)	6 (40.0)	0.345
Q14. Is there much incorrect information regarding contraception on the Internet?	5 ( 62.5)	2 (13.3)	0.026
Q15. Whom should you consult about contraception?	7 ( 87.5)	12 (80.0)	0.523

Table 5 Evaluation on readability and the reasons (N=23)

Evaluation	n (%)	Reason <sup>†</sup>
Illustrations		
Good	17 (73.9)	<ul style="list-style-type: none"> <li>· The contents were explained with both manga illustrations and text.</li> <li>· The manga illustrations were the proper size.</li> <li>· The manga illustrations were easy to read.</li> <li>· The manga illustrations were drawn in two colors.</li> </ul>
Moderate	3 (13.0)	
Bad	3 (13.0)	<ul style="list-style-type: none"> <li>· Photographs would be preferable to depict the contraceptives.</li> </ul>
Text		
Good	17 (73.9)	<ul style="list-style-type: none"> <li>· The letter size was adequate.</li> <li>· Kanji characters were accompanied by kana characters.</li> </ul>
Moderate	2 ( 8.7)	
Bad	4 (17.4)	<ul style="list-style-type: none"> <li>· The letters in the text were too small.</li> <li>· I did not understand the contents at all.</li> </ul>

<sup>†</sup> Representative descriptions were extracted.

place any restrictions on time. When pamphlets are used in healthcare settings, healthcare professionals focus on and explain some of the contraceptive methods that are most appropriate for that couple. It is not common to have to read all contents of the pamphlet in one sitting in actual clinical settings. Therefore, we can expect a higher comprehension of the contents in actual clinical settings than the results shown in the present study. Healthcare professionals have to utilize this pamphlet as a supplement to their explanations in order to gain a better outcome. It is not easy even for people without disabilities to absorb a lot of



information in a short time; it is reasonable to assume that this task was too demanding for people with ID because of limited memory capacity<sup>8)</sup>. In addition, one participant indicated that actual photos would be preferable to illustrations. Photographs provide a great deal of information, but the researchers believe it is possible that manga can provide the same amount of information in detailed drawings and by emphasizing essential parts.

There were both positive and negative evaluations concerning the size of the text. The negative evaluations might have been related to the participants' age. Age was not included in the selection criteria for this study. One participant was in his 60s and four were in their 50s, and they may have preferred larger text.

According to the "Guidelines for Creating LL Manga" devised by Tsuru, LL manga is to be drawn by connecting each scene following the flow of time. As an example, the explanations about how to put on a male condom contained in the pamphlet included instructions from tearing open the package to throwing it away after sexual intercourse. Hence, although the pamphlet was A4 size to allow ample space for illustrations depicting each scene, in fact, some letters might have been too small for participants in their 50s and 60s.

There was significant relevance between correct answers on the post-test and having a child in the following three questions: "Is it correct to put on two male condoms?", "Is putting on a male condom at the beginning of sexual intercourse correct?" and "Is there a lot of incorrect information regarding contraception on the Internet?" Although the DSM-5 diagnostic criteria of ID refer to difficulty in learning from experience, the couples in the present study who had experienced childbirth and childrearing were more likely to understand how to use a male condom and the state of information on the Internet. This leads to the apparent importance of providing health counseling based on the person's experience, regardless of his/her intellectual ability.

Today, all scholars agree that there are fewer choices of contraceptives in Japan than in other countries. Several modern contraceptive methods prevalent in foreign countries have not yet been approved in Japan, such as progestin-only pills, contraceptive patches, injections, and implants. For this reason, the instructional pamphlet in this study explained only three methods (the male condom, the contraceptive pill, and IUDs), which ironically contributed to a shorter pamphlet. We added male sterilization, female sterilization, and emergency contraception to the contents of the latest version of the pamphlet revised after this investigation, aiming to prevent failure and trouble with contraception after the puerperal period<sup>†1)</sup>.

It is essential that more modern contraceptives be approved and made available in Japan as soon as possible, which should help to guarantee sexual and reproductive health and rights for everyone, including people with ID.

Although the researchers attempted to use easy, non-technical words in the pamphlet, there were several words or expressions for which we could not find alternatives. The Japanese text consisted of Chinese characters and kana characters. A Kanji character has specific meaning itself, and a combination of two to four Kanji characters produces words with other meanings. Some words describing contraception consist of Kanji characters with many brushstrokes that seem to be difficult for people with ID to understand.

Another reason why the participants were not familiar with some of the words and expressions on contraception is likely to be due to poor sex education in Japan. The United Nations Educational Scientific and Cultural Organization's International Technical Guidance on Sexuality Education<sup>9)</sup> recommends implementation of comprehensive sexuality education<sup>†2)</sup> for every child and young person in accordance with their developmental diversity. Nevertheless, in 2003, the Tokyo Metropolitan Board of Education severely punished 13 teachers at Tokyo Metropolitan Nanao Special School, including the principal, for providing "excessive" sex education to students with ID<sup>10,†3)</sup>. Since then, school teachers have hesitated to provide sex education out of fear of punishment by the Board of Education and criticisms by students' parents. In Japanese culture, the direct expression of sexual matters is considered taboo. Accordingly, the use of words or illustrations of genital areas and intercourse tends to be avoided even in sex education.

The fact that teachers at Nanao Special School explicitly taught students about the genital area and sexual intercourse taking into account the characteristics of ID by using puppets and illustrations can be considered groundbreaking. Today, while there are some conservative views on sex education, direct, accurate words and expressions have gradually become more acceptable. Ito et al. issued a guidebook on sex education for children with ID, in which they used illustrations to explain the genital area, sexual activity, how to change sanitary napkins during menstruation, and other topics<sup>11)</sup>. In light of the current situation where children are exposed to an abundance of sexual information on the Internet, providing more specific and accurate sex education is crucial especially for people with ID. For these reasons, the researchers believe it would be beneficial to use the LL manga illustrations and text included in this pamphlet for sex education in schools.

## 7. Outlook

This study tried to be the first step in providing a practical solution for guaranteeing sexual and reproductive health and rights for people with ID and it is expected to be useful in interdisciplinary collaboration between nursing, speech therapy and manga. More research is needed on the development of educational material for people with ID in clinical settings.

## 8. Limitations

The findings were purposely limited to the current sample of 23 participants. In addition, because care staff were present during this investigation, some participants may not have felt comfortable answering the questions in front of them, and therefore, bias may exist among the participants' responses.

## 9. Conclusion

We concluded that the illustrations and text on contraception included in the pamphlet were sufficient and useful in terms of readability; however, further improvements might be needed regarding comprehensibility.

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## Conflict of interest

None was declared by the authors.

## Notes

† 1) The latest version of the pamphlet can be downloaded directly here: [https://researchmap.jp/read0123877/published\\_works](https://researchmap.jp/read0123877/published_works).

† 2) The United Nations Educational Scientific and Cultural Organization defines comprehensive sex education as "a curriculum-based process of teaching and learning about the cognitive, emotional, physical and social aspects of sexuality."

† 3) In 2010, the Supreme Court ruled that punishing the teachers was illegal.

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