

# The Relationship between Understanding Disability according to Medical and Social Models and Attitudes toward People with Disabilities

— Survey of Students immediately after entered University in Japan —

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## I . Introduction

Models for understanding disabilities can be divided into medical and social models. Medical model suggests that disability is caused solely by impairments in mental and physical functioning, whereas social model is based on the idea that disability results from the presence of various barriers in society. The Convention on the Rights of Persons with Disabilities adopted by the United Nations in 2006 stipulates that the limitations that people with disabilities face in their daily or social lives are due not only to impairments in mental and physical functions but also to various barriers in society (Cabinet office of Japan 2023). Japan signed the Convention on the Rights of Persons with Disabilities in 2007 and subsequently amended the Basic Act for Persons with Disabilities in 2011, revising the definition of persons with disabilities to reflect social models. A report on the public's understanding of disability from 2017 to 2021 revealed that the approval rate for social model of disability was higher than that for medical models every year (Nippon research center 2021). Social model of disability has become a mainstream source

of Japanese people's understanding of disabilities.

Many studies have shown that experiences interacting with people with disabilities or participating in workshops on disabilities influence attitudes toward people with disabilities. People with volunteer experience have more positive attitudes toward people with disabilities than do those with no volunteer experience (Iwata 2002, Arai 2015). Additionally, people with family members with disabilities have more favorable attitudes toward people with disabilities than those without (Stachura & Garven 2007, Satchidanand et al. 2012). In clinical practice, people's negative attitudes toward people with disabilities change to positive attitudes through interactions with people with disabilities (Minegishi & Furuya 2000, Irei & Suzuki & Hirakami 2013). It has been reported that lectures about people with disabilities positively affect attitudes toward them (Gething & Westbrook 1983, Tokuda 1990a, Ishige & Hayashi 2000) and that interacting with people with disabilities in clinical practice makes attitudes toward them more positive (Ito & Yamazaki & Nagatoshi &

Yamamura 2005). While some studies have shown that interacting with people with disabilities leads to negative attitudes toward people with disabilities (Hoshigoe 2005, Yabuta & Yamashita & Iseki 2016), others have demonstrated that interacting with people with disabilities leads to improved attitudes toward them. In addition, sex (Paris 1993, Tervo & Azuma & Palmer & Redinius 2002, Aiba & Nara & Masuda & Suzuki 2019), age (Ryan 1981, Lindgren & Oermann 1993), and undergraduate major (Ogiwara 2000, Stachura & Garven 2007) are related to attitudes toward people with disabilities.

No research has directly examined the relationship between understanding disability according to medical and social models and attitudes toward people with disabilities. With respect to social models, the NPO Disability Equality Training Forum reports that after training, people's understanding of disability shifts toward social model, and their interactions with and attitudes toward people with disabilities improve (Nippon research center 2017). These findings suggest that attitudes toward people with disabilities may differ depending on how disability is understood on basis of medical and social models. However, it remains unclear whether attitudes toward people with disabilities differ depending on understanding disability according to medical model or social model and the balance between them. Furthermore, it is unclear how experience interacting with people with disabilities, which influences attitudes toward people with disabilities, changes understanding disability according to medical and social models.

On basis of interaction experiences, if we

can clarify the relationship between understanding disability according to medical and social models and attitudes toward people with disabilities, we can identify the influence of education on these attitudes. Therefore, the purpose of this study was to examine the following three research questions.

(1) Are there differences in understanding disability according to medical and social models of disability and attitudes toward people with disabilities depending on different experiences interacting with people with disabilities? (2) What are the relationships between understanding disability according to medical and social models and attitudes toward people with disabilities depending on different experiences interacting with people with disabilities? (3) What factors influence attitudes toward people with disabilities?

Disabilities include physical disabilities, intellectual disabilities, and mental disabilities. Considering the opportunities for contact and interaction with and access to information about people with disabilities, typical students may not be able to visualize these three types of disabilities in detail. Therefore, we decided to treat disabilities as a whole rather than by disability type.

## II. Methods

### 1. Participants

We conducted a cross-sectional study via a questionnaire survey. The questionnaire survey was conducted during the students' first class in April 2023. The participants were 606 first-year Japanese university students who had just entered university. Among them, 588 people were selected. One person who could not consent to participate in

the study and 17 people who were older than 21 years were excluded. Because age is a factor that influences attitudes toward people with disabilities (Ryan 1981, Lindgren & Oermann 1993), we excluded people aged 21 and older, as they could not be considered part of the same group as the other students. The students were from a variety of majors, including majors in the Department of Dentistry, Department of Pharmaceutical Sciences, Department of Nursing, Department of Clinical Laboratory Science, Department of Physical Therapy, Department of Occupational Therapy, Department of Speech-Language-Hearing Therapy, and Department of Social Management. We decided to conduct the survey during the students' first class immediately after they entered school to avoid the influence of major-specific education. According to G-Power statistical software (version 3.1.9.6), when using the Mann-Whitney U test (effect size 0.5,  $\alpha$  error 0.05, power 0.95), a sample size of 220 or more participants was needed. Therefore, we surveyed a sufficient number.

Numerous studies have shown that

experience interacting with people with disabilities (Iwata 2002, Hoshigoe 2005, Satchidanand et al. 2012, Yabuta et al. 2016) and participating in workshops on disabilities (Nippon research center 2017) influence attitudes toward people with disabilities. Therefore, we divided the participants into two groups (the interaction experience group and the control group) on basis of their experience interacting with disabled people and their experience participating in workshops on disabilities. The participants' ages, the male-to-female ratio and the number of participants is shown in Table 1.

## 2. Questionnaire survey

The survey items covered basic information, understanding disabilities according to medical and social models, and attitudes toward people with disabilities.

The basic information included sex, age, whether the respondent or a close family member had a disability, whether the respondent had a friend with a disability, whether the respondent had volunteer experience, and whether the respondent had participated in a disability workshop.

Table 1. The number, ratio of male to female and age of participants.

	Participants <i>n</i> =588	
	Interaction experience group <i>n</i> =273	Control group <i>n</i> =315
Male/Female( <i>n</i> / <i>n</i> )	(101/172)	(102/213)
Age	18.1±0.3	18.1±0.3

Means ± standard deviations

Interaction experience and the control groups were named basis of experience of interacting with people with disabilities and participating in workshops on disabilities or not.

Each section on understanding disability according to medical and social models consisted of 10 questions (Table 2). For each question, the subjects selected one score from a 7-point scale (from strongly agree to strongly disagree). For each questionnaire item, the response “strongly agree” was given 7 points, the response “strongly disagree” was given 1 point, and the total score for each item was used to indicate understanding disability according to medical and social models. The minimum score for each item was 10 points, and the maximum score was 70 points. The

content of each question was created by partially modifying the survey to promote a barrier-free mindset through Disability Equality Training (Nippon research center 2017).

The questionnaire included 16 questions about attitudes toward people with disabilities (Table 3). For each question, the subjects selected one rating from a 7-point scale (from strongly agree to strongly disagree). For each item, a response of "strongly agree" was given 7 points, a response of "strongly disagree" was given 1

Table 2. Questions on understanding disability according to medical and social models of disabilities.

Understanding disability according to medical model	Understanding disability according to social model
Disability is problem of medical	Disability is problem of social
Disability is caused by the physical functions	Disability is caused by environment barriers such as steps
The problems of disability are caused by the motivation of people with disabilities	The problems of disability are caused by prejudice and discrimination
The problems of disability are caused by the degree of their functions	The problems of disability are caused by institutional constraints
The problems of disability are caused by people with disabilities themselves do not undergo rehabilitation	The problems of disability are caused by not providing adequate information
Wheelchair users should strive for rehabilitation so that they can move freely	An environment should be created so that wheelchair users can move freely
The problems of disability can be resolved through the rehabilitation efforts of disabled people themselves	The problems of disability are solved by providing opportunities for rehabilitation
The responsibility for resolving disabilities lie people with disabilities	The responsibility for solving disabilities lie with society
In order for people with disabilities to return to society, they must make efforts themselves	In order for people with disabilities to return to society, society must change
You cannot be involved in solving problems of disabilities	You can participate in solving problems of disabilities

Table 3. Questions on attitudes towards people with disabilities.

I don't be unreasonably refrain towards people with disabilities	7	6	5	4	3	2	1
I have no hesitation in including people with disabilities into our group	7	6	5	4	3	2	1
I can talk to people with disabilities without any resistance	7	6	5	4	3	2	1
I want to become friends with people with disabilities	7	6	5	4	3	2	1
People with disabilities live in the same world as me	7	6	5	4	3	2	1
I would like to work with people with disabilities	7	6	5	4	3	2	1
I don't be too careful when dealing with people with disabilities	7	6	5	4	3	2	1
I want to actively interact with people with disabilities	7	6	5	4	3	2	1
I can communicate with people with disabilities	7	6	5	4	3	2	1
I can share joy and fun with people with disabilities	7	6	5	4	3	2	1
When I meet people with disabilities, I can lend a hand without hesitation	7	6	5	4	3	2	1
It is better for people with disabilities to live in society than in institutions	7	6	5	4	3	2	1
I can feel free to approach people with disabilities	7	6	5	4	3	2	1
People with disabilities are not necessarily inferior in all aspects	7	6	5	4	3	2	1
I have interested in people with disabilities	7	6	5	4	3	2	1
I don't think we should just leave the welfare of people with disabilities to charities	7	6	5	4	3	2	1

1: Strongly Disagree 2: Disagree 3: Somewhat Agree 4: Neutral 5: Somewhat Agree 6: Agree  
7: Strongly Agree

point, and the total score for each item was used to indicate attitudes toward people with disabilities. The minimum possible score was 16 points, and the maximum possible score was 112 points, with a higher score indicating more positive attitudes toward people with disabilities. The questions were partially adapted from Tokuda's (1990b, 1991) Multi-Dimensional Attitude Scale. This scale has been tested for reliability and validity. Tokuda's (1990b) Multi-Dimensional Attitude Scale includes five dimensions: refusal, integration, special ability, egocentrism, and perplexity. In this study, parts of the refusal and perplexity dimensions were defined as attitudes toward people with disabilities.

With respect to these five dimensions, "refusal" is an attitude that evaluates the degree of rejection and ability toward people with disabilities in daily life, and "perplexity" reflects the degree of confusion in contacting and interacting with people with disabilities. The "integration" dimension explores the degree of acceptance of integrated education, and the "special ability" dimension focuses on whether people with disabilities have particularly excellent abilities. The "egocentrism" dimension asks about the degree to which people with disabilities are self-centered. The final three dimensions seem to focus on impressions of people with disabilities and education for people with

disabilities. In this study, we wanted to evaluate student attitudes and awareness when coming into contact with and interacting with people with disabilities in their daily lives, so we decided to adopt the "refusal" and "perplexity" dimensions.

The present study was conducted in compliance with the Declaration of Helsinki and the Ethical Guidelines for Medical and Health Research Involving Human Subjects and was approved by the Ethics Committee of the School of Rehabilitation Sciences, Health Sciences University of Hokkaido (approval number 22R173165).

### 3. Statistics

The data are shown as the means  $\pm$  standard deviations. A Mann-Whitney U test was conducted to compare the interaction experience group and the control group with respect to understanding disability and attitudes toward people with disabilities according to medical and social models. The relationship between understanding disability and attitudes toward people with disabilities according to medical and social models was analyzed via Spearman's rank correlation coefficient.

Multiple regression analysis (stepwise method: variable increase method, F value significance level  $<0.05$ ) was used to examine factors that influence attitudes toward people with disabilities. Attitudes toward people with disabilities was the dependent variable, and sex, age, having close relatives with disabilities, having friends with disabilities, volunteer experience, experience participating in workshops on disabilities, and understanding disability according to medical and social models were the independent variables. All the statistical

analyses were performed via IBM SPSS Statistics 26 for Windows. The significance level was set at  $p < 0.05$ .

### III. Results

Table 4 shows the respondents' attitudes toward people with disabilities and their understanding of disability on basis of medical and social models in the interaction experience and control groups. The average score for understanding disability according to medical models was  $38.2 \pm 6.9$  points for the interaction experience group and  $39.4 \pm 5.6$  points for the control group, indicating a significantly lower score for the interaction experience group. The effect size of the difference between the interaction experience group and the control group in understanding disability according to medical model was  $r = -0.09$ . With respect to the average score for understanding disability according to social model, there was no significant difference between the interaction experience group ( $53.5 \pm 6.7$  points) and the control group ( $53.8 \pm 5.8$  points). There was no significant difference in the ratio of understanding disability according to social model to understanding disability according to medical model between the interaction experience group ( $1.4 \pm 0.4$ ) and the control group ( $1.4 \pm 0.3$ ). The score for attitudes toward people with disabilities was significantly higher for the interaction experience group ( $89.0 \pm 11.6$  points) than for the control group ( $84.3 \pm 12.1$  points). The effect size of the difference in attitudes toward people with disabilities between the interaction experience group and the control group was  $r = 0.19$ .

Table 4. Understanding disability according to medical model, understanding disability according to social model, and attitude score toward people with disabilities in the interaction experience and control groups.

	Interaction experience group	Control group	<i>p</i> -value
Understanding disability according to medical model	38.2±6.9	39.4±5.6*	0.035
Understanding disability according to social model	53.5±6.7	53.8±5.8	0.711
The ratio of understanding disability according to social model to understanding disability according to medical model	1.4±0.4	1.4±0.3	0.134
Attitudes toward people with disabilities	89.0±11.6	84.3±12.1*	0.001

Means ± standard deviations

\*  $p < 0.05$  VS Interaction experience group

Interaction experience and the control groups were named basis of experience of interacting with people with disabilities and participating in workshops on disabilities or not.

Table 5 shows the correlation between understanding disability according to medical and social models and attitudes toward people with disabilities in the interaction experience group and the control group. A significant negative correlation was observed between understanding disability according to medical model and attitudes toward people with disabilities for both the interaction experience group ( $r = -0.141$ ,  $p < 0.05$ ) and the control group ( $r = -0.163$ ,  $p < 0.01$ ). A significant positive correlation was observed between understanding disability according to social model and attitudes toward people with disabilities for both the interaction experience group ( $r = 0.409$ ,  $p < 0.01$ ) and the control group ( $r = 0.459$ ,  $p < 0.01$ ). A significant positive correlation was observed between the ratio of understanding disability according to

social model to understanding disability according to medical model and attitudes toward people with disabilities for both the interaction experience group ( $r = 0.365$ ,  $p < 0.01$ ) and the control group ( $r = 0.425$ ,  $p < 0.01$ ).

To examine the factors that influence attitudes toward people with disabilities, we conducted multiple regression analysis via a stepwise method (Table 6). Understanding disability according to social model, understanding disability according to medical model, volunteer experience, having friends with disabilities, experience participating in workshops on disabilities and having close relatives with disabilities were extracted as factors that influence attitudes toward people with disabilities. Although understanding disability according to medical model had a

Table 5. The correlation between understanding disability according to medical and social models and attitudes toward people with disabilities in the interaction experience group and the control group.

	Interaction experience group attitude score	Control group attitude score
Understanding disability according to medical model	-.141*	-.163**
Understanding disability according to social model	.409**	.459**
The ratio of understanding disability according to social model to understanding disability according to medical model	.365**	.425**

\*  $p < 0.05$     \*\*  $p < 0.01$

Interaction experience and the control groups were named basis of experience of interacting with people with disabilities and participating in workshops on disabilities or not.

negative impact, the other factors had a positive impact. Sex and age were excluded from the factors that influenced attitudes toward people with disabilities in the multiple regression analysis. The standard partial regression coefficient beta of the multiple regression analysis was 0.451 for understanding disability according to social model, -0.2 for understanding disability according to medical model, 0.084 for volunteer experience, 0.1 for having friends with disabilities, 0.084 for experience participating in workshops on disabilities, and 0.072 for having a close relative with a disability. These six variables explained approximately 27% of the respondents' attitudes toward people with disabilities (attitudes toward people with disabilities =  $41.506 + 0.876 \times (\text{understanding disability according to social model}) - 0.389 \times (\text{understanding disability according to medical model}) + 3.159 \times (\text{volunteer experience}) + 3.037 \times$

(having friends with disabilities) +  $2.718 \times (\text{experience participating in workshops on disabilities}) + 2.229 \times (\text{having close relatives with disabilities})$ ).

#### IV. Discussion

There was no significant difference between the interaction experience group and the control group in understanding disability according to social model but understanding disability according to medical model was significantly lower in the interaction experience group than in the control group. This finding indicates that people who have no experience interacting with people with disabilities or participating in workshops on disabilities tend to understand disabilities on basis of medical model. The effect size of the difference between the interaction experience group and the control group for understanding disability according to medical model was  $r = -0.09$ , which is considered an

Table 6. Multiple regression analysis for the factors influencing attitudes towards people with disabilities.

	unstandardized coefficient		Standardi-zation coefficient	significance probability	VIF
	<i>B</i>	standard error	$\beta$		
(constant)	41.506	5.005		0	
Understanding disability according to social model	0.876	0.069	0.451	<0.001	1.007
Understanding disability according to medical model	-0.389	0.069	-0.2	<0.001	1.014
Volunteer experience	3.159	1.431	0.084	0.028	1.156
Having friends with disabilities	3.037	1.076	0.1	0.005	1.02
Experience participating in workshops on disabilities	2.718	1.212	0.084	0.025	1.127
Having close relatives with disabilities	2.229	1.109	0.072	0.045	1.048

VIF (Variance Inflation Factor) is a variance expansion factor.

Summary of multiple regression analysis:  $r=0.529$ ,  $r^2=0.280$ , adjusted  $r$  squared= $0.272$ , standard error of estimate= $10.320$ ,  $F=37.586$ ,  $p<0.01$

almost meaningless difference. With respect to the ratio of understanding disability according to social model to understanding disability according to medical model, understanding disability according to social model was approximately 1.4 times greater than understanding disability according to medical model for both the interaction experience group and the control group. This finding indicates that both groups understand disability on basis of social rather than medical model. This study targeted university students who had just entered university and examined whether they had any experience volunteering or participating in workshops on

disabilities. Therefore, regardless of whether they had such interaction experiences, Japanese university students appear to understand disabilities on basis of social model rather than medical model. A report by the Nippon Research Center (2021), which surveyed Japanese people from 2017 to 2021 on their understanding of disability according to medical and social models, revealed that social model produced a better understanding of disability than did medical model. This report does not necessarily match the results of this study because it did not examine sex, volunteer experience, or experience participating in workshops on disabilities, but both

demonstrate that individuals tend to understand people with disabilities on basis of social model.

Attitudes toward people with disabilities in the interaction experience group were significantly better than those in the control group. Multiple regression analysis revealed that volunteer experience, having friends with disabilities, experience participating in workshops on disabilities and having close relatives with disabilities are positive factors that influence attitudes toward people with disabilities. These results suggest that experience interacting with people with disabilities and participating in workshops on disabilities are related to positive attitudes toward people with disabilities. Previous studies have reported that people who have volunteer experience or family members with disabilities have more positive attitudes toward people with disabilities than those who do not (Iwata 2002, Stachura et al. 2007, Satchidanand et al. 2012, Arai 2015). Other studies indicate that attitudes toward people with disabilities become more positive after people receive training on disabilities (Gething et al. 1983, Tokuda 1990a, Ishige et al. 2000). These results are in line with the findings of this study. However, previous research has suggested that increasing experience with people with disabilities does not lead to positive attitudes toward people with disabilities (Hoshigoe 2005). Hoshigoe (2005) reported that increased interaction experience with mentally disabled people does not necessarily lead to more favorable attitudes. It has also been reported that there are differences in the level of acceptance in interactions with people with physical disabilities depending on developmental

stage (Ryan 1981). Therefore, developmental stage and interaction experience need to be treated with caution, as they can influence attitudes toward people with disabilities.

In both the interaction experience group and the control group, there was a weak negative correlation between understanding disability according to medical model and attitudes toward people with disabilities and a moderate positive correlation between understanding disability according to social model and attitudes toward people with disabilities. This means that understanding disability according to social model is a positive factor in attitudes toward people with disabilities, whereas understanding disability according to medical model is a negative factor regardless of one's experience interacting with people with disabilities or participating in workshops on disabilities. The NPO Disability Equality Training Forum reports that after training, people's understanding of disability shifts toward social model, and their attitudes toward and images of people with disabilities improve (Nippon research center 2017). This report supports the findings of this study, which demonstrate that understanding disability according to social model is positively correlated with attitudes toward people with disabilities. The present study shows that understanding people with disabilities on basis of medical model is a negative factor in attitudes toward people with disabilities. This finding is thought to clarify the problems with education based solely on medical model. In August 2022, the United Nations Committee on the Rights of Persons with Disabilities held its first review of Japan regarding the implementation of the Convention on the

Rights of Persons with Disabilities and presented concluding observations. Among them, Japan is required to break away from medical model and shift to understanding disability according to social model/human rights model (United Nations 2022). Considering these requirements for Japan with respect to the rights of people with disabilities, we suggest that there is a need to shift disability education from medical model to social model.

Sex and age were excluded from the factors that influenced attitudes toward people with disabilities in the multiple regression analysis. Age was excluded because this study excluded people older than 21 years. However, the fact that no relationship was found between sex and attitudes toward people with disabilities in this study is inconsistent with the results of many previous studies in which women exhibited more positive attitudes than men did (Paris 1993, Ogiwara 2000, Tervo & Azuma & Palmer & Redinius 2002, Satchidanand et al. 2012, Aiba & Nara & Masuda & Suzuki 2019). This difference may be due to differences in the scales used for attitudes toward people with disabilities. Many previous studies have evaluated attitudes via the ATDP (Attitudes Toward Disabled Persons Scale) developed by Yuker et al. (Paris 1993, Ogiwara 2000, Tervo & Azuma & Palmer & Redinius 2002). It has been reported that the ATDP is a one-dimensional scale and cannot accurately and adequately explain the typical person's attitudes toward children and people with disabilities (Tokuda 1990b). Therefore, in this study, we decided to use Tokuda's (1990b) Multi-dimensional Attitude Scale rather than the ATDP. To investigate whether there are

differences in attitudes toward disabilities depending on sex, future research needs to be conducted using multiple scales, including the ATDP.

In this study, the survey was conducted without regard to the type of disability, so it is not possible to know which disability was assumed in the participants' responses. Therefore, it is unclear whether the same conclusion can be drawn for each type of disability. In the future, the author would like to examine differences in understanding disability and attitudes toward people with disabilities depending on the type of disability.

## V. Conclusions

The results of this study revealed that the interaction experience group had significantly lower scores for understanding disability according to medical model and significantly higher scores for attitudes toward people with disabilities than did the control group. Understanding disability according to medical model was negatively related to attitudes toward people with disabilities regardless of experience interacting with disabled people, whereas understanding disability according to social model was positively related. Furthermore, multiple regression analysis revealed that understanding disability according to medical model was a negative factor, whereas understanding disability according to social model, volunteer experience, having friends with disabilities, experience participating in workshops on disabilities and having close relatives with disabilities were positive factors. These results suggest that understanding disability on basis of social model and interacting closely with people

with disabilities are both important, but that understanding disability according to medical model is problematic.

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# The Relationship between Understanding Disability according to Medical and Social Models and Attitudes toward People with Disabilities

—Survey of Students immediately after entered University in Japan—

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It is unclear how understanding disability according to medical and social models relates to attitudes toward people with disabilities that are influenced by experiences interacting with people with disabilities. We attempted to clarify the relationship between understanding disability according to medical and social models and attitudes toward people with disabilities on basis of experiences interacting with people with disabilities. We conducted a cross-sectional study using a questionnaire survey of 588 Japanese university students who had just entered university. The participants were divided into two groups (interaction experience group and control group) on basis of their experience of interacting with people with disabilities and their experience participating in workshops on disabilities.

The interaction experience group had significantly lower scores on understanding disability according to medical model than did the control group. The interaction experience group had significantly higher scores for attitudes toward people with disabilities than did the control group. There was a significant negative correlation between understanding disability according to medical model and attitudes toward people with disabilities in both the interaction experience and control groups. There was a significant positive correlation between understanding disability according to social model and attitudes toward people with disabilities in both the interaction experience and control groups. Using multiple regression analysis, understanding disability according to social model, understanding disability according to medical model, volunteer experience, having friends with disabilities, experience participating in workshops on disabilities and having close relatives with disabilities were extracted as factors that influence attitudes toward people with disabilities. Although understanding disability according to medical model had a negative impact, other factors had a positive impact.

These results suggest that understanding disability on basis of social model and interacting closely with people with disabilities are both important, but that understanding disability according to medical model is problematic.