An Interactional Model of Mental Disability (IMMD) Based on the International Classification of Functioning and Disability (ICIDH-2)

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Abstract: Some models based on the International Classification of Impairments, Disabilities, and Handicaps (ICIDH) are being put forward and tested world-wide for various objectives. An Interactional Model of Mental Disability (IMMD) is proposed here as a new practical rehabilitation model based on the ICIDH and the International Classification of Functioning and Disability (ICIDH-2). The IMMD provides a basis for understanding the interaction of mental disabilities (impairments, disabilities and handicaps) and other factors (environmental factors, personal factors). The other feature of the IMMD is that it provides a recording format for a practical application of the model. From our experience with the IMMD, we conclude that it is useful for understanding the client's condition and disability, for setting goals and implementing a team approach for professionals, and for helping the client understand his/her own condition and the services provided.

Key words: ICIDH, model of disability, rehabilitation model, IMMD

Introduction

In Japan, the major shift in medical concern from the treatment of acute diseases to chronic diseases has highlighted the need for early medical rehabilitation, social rehabilitation, or both to focus on the quality of life of people with disability. The functional management of daily living, not only the treatment for disease, has become the goal of rehabilitation. Disability should also be classified so that consequences associated with health conditions can be systematically grouped.

The World Health Organization (WHO) first issued the International Classification of Impairments, Disabilities, and Handicaps (ICIDH) in 1980 for trial purposes. The ICIDH-1980 (WHO, 1980) contains a classification of disabilities that systematically groups consequences associated with health conditions. The ICIDH-1980 has been used to collect data for the evaluation of health care delivery, policy and...
financing. The educational value of the ICIDH-1980 has been to raise awareness of the consequences of health conditions and people’s participatory rights. However, in daily psychiatric clinical contexts, the ICIDH-1980 is less useful as a clinical rehabilitation tool.

We have therefore developed a new practical rehabilitation model, which we call an Interactional Model of Mental Disability (IMMD) based on the ICIDH-2 (WHO, 1997; 1999), and which also includes a team conferencing work sheet and a self-assessment sheet to facilitate application of the IMMD to rehabilitation practices.

**Transition and Problem of a Model of Mental Disability**

In Japan, Ueda (Ueda, 1980) introduced a model which was an adaptation of the ICIDH-1980. Since, a structural model for mental disability had long been a subject of discussion in the Japanese psychiatric domain, the Ueda model gave rise to a lively debate. A few models (Hachiya, 1981; Utena, 1985; Anzai et al., 1984) have been proposed to explain and classify mental disabilities, but there have never been enough consensuses to establish a common language and concepts. After the 1988 and 1995 revisions of the Japanese Mental Health Law, heated discussions among rehabilitation professionals about models for mental disability have become commonplace (Yamane, 1997; Asano, 1999; Tomioka, 1999).

The 1988 and 1995 revisions of the Japanese Mental Health Law led to rapid changes in the rehabilitation and medical treatment of mental patients. The new law has placed special emphasis on the human rights of the mentally ill and the social participation of people with mental disabilities. In order to facilitate the implementation of these concepts, a commonly accepted classification of disability is required for a model that enables communication about health conditions in various disciplines.

The ICIDH is helpful for making a distinction among impairments, disabilities and handicaps as separate concepts and is useful for health care practice, administration, research, education and policy. However, some problems with the 1980 model (Fig. 1) (WHO, 1980) are:

1. **Impression of model**
   It is a medical model that incriminates disease as disability.

2. **Visual representation**
   The arrows linking disease or disorder, impairments, disabilities and handicaps in Figure 1 has been interpreted as representing a causal model and as indicating a change over time. This representation thus implies a unidirectional flow from impairment to disability to handicap.

3. **Effects of personal factors and environmental factors**
   Personal factors such as individual abilities and environmental factors play an important role in the disability process because of their interactions with all three dimensions of the classification. Therefore, their effects should be included in the figure.

4. **Content**
   It is difficult to clearly differentiate between impairments and disabilities.

5. **Terminology**
   There is considerable disagreement concerning the terminology of the model, particularly words like handicaps and disabilities, which are thought to have negative connotations.

In the last decade, some studies (Polatajko, 1992; Martini et al., 1995; Fougeyrollas, 1993; Japanese Association of Psychiatric Rehabilitation (JAPR), 1996; 1997) have concentrated on improvement on the ICIDH-1980 or a better fit for the occupational therapy and the psychiatric domain. Yamane (1996, 1997) has described some structural models for psychiatric diseases and disabilities in which personal factors, such as individual abilities, environmental factors, and details of mental disability, are reflected.

WHO devoted an annual conference to the
revision of the ICIDH hosted by the WHO Collaborating Centre in Paris in 1995 (WHO, 1995). Since then, the overall concept (Fig. 2) of the current version of the ICIDH-2 (WHO, 1997; 1999) has been introduced for field trials. The following problems of this revised version have been pointed out (Yamane, 1999):

1. Although the ICIDH-2 is generally expressed in non-judgemental terms without undue negativity, it includes one negative term, impairment. The term impairment was changed to body functions and structure in the Beta-2 Draft (WHO, 1999).

2. It does not adequately reflect interactions among disabilities.

3. There is some confusion about terminology because activity and participation have been defined differently from their commonly accepted definitions.

4. The relationships and meanings indicated by arrows showing the effects of Environmental Factors and Personal Factors in the ICIDH-2 Beta-1 and Beta-2 Drafts need to be made more explicit.

The ICIDH-2 will be completed by the end of the year 2001 following the results of the field trials. Various models based on the ICIDH-1980 and the ICIDH-2 are now being put forward and tested on a world-wide basis for various objectives (e.g., Fougeyrollas, 1993; Yamane, 1996; 1997; Arizuka, 1995; Ueda, 1996; Nakazawa, 1996; Ohashi, 1997).

**Characteristics of the Principal Models**

Let us first analyze the characteristics and limitations of the principal models based on the ICIDH. The Canadian model (ICIDH-PR model) (Martini et al., 1995; Fougeyrollas, 1993) is an explanatory model of the consequences of disease and trauma. The Canadian model highlights the nature of handicaps as the situational result of an interactive process between the characteristics of a person's impairments, disabilities and the social and environmental obstacles in a given situation (Fougeyrollas, 1994). The latest Canadian model shows the interrelationships of personal factors (organic systems and capabilities), environmental factors and life habits, but not the interaction of impairments and disabilities, and the schema itself is complicated.

The Yamane model (Yamane, 1996; Yamane, 1997) accounts for the interaction between disabilities and the effects of environment and individual ability. In the Hiroaki (Arizuka) Model (Arizuka, 1995), individual capability while in good health and handicaps before illness are considered. Although this model shows the interrelationships among disabilities and other factors in a manner which is useful for grasping the concept of disability, the figure is too complicated for clinical use.

The Nakazawa model (a spiral model) (Nakazawa, 1996) tries to depict “the difficulty of living” (Utena, 1985). Heated arguments were exchanged between the proponents of the Nakazawa model and of the Ueda model (JAPR, 1996). The former model shows how difficulties of living are generated. The Ohashi model (Ohashi, 1997), on the other hand, attempted to describe many different patterns of interaction of environmental factors. This model is made up of

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**Fig. 2.** Current interactions of ICIDH-2 (Beta-2 Draft)
nine visual representations. It is unique in that it illustrates the situation associated with individual disabilities, but it is difficult to execute because of its conceptual modality.

All these models, which are revisions of the mother model in the ICIDH, focus on different aspects of disability for various objectives. However, none of the models are clinical, only conceptual.

Necessity for a Practical Rehabilitation Model of Mental Disability

Some have suggested that the WHO should publish an officially authorized “Mother Model” of ICIDH-2, such as shown in Figure 2 and introduce various versions based on the “Mother Model” (Japan ICIDH-2 Field Trials Planning Committee, 1998; Nakazawa, 1997; Sato, 1996). In order to apply a model of disability to psychiatric rehabilitation practices, it is necessary to define the characteristics of mental disability. In contrast to physical disabilities, characteristics specific to mental disability (Utena, 1985; Anzai et al., 1984; Asano, 1999; Yamane, 1997; Nakazawa, 1996; Sato, 1996; Lin, 1991) are:

1. Disease coexists with disability. To deal with the fact that disease coexists with disability, both the treatment of disease and the rehabilitation of disability in daily living should be performed at the same time.
2. Secondary disorders may surface because of long-term hospitalization. To avoid secondary disorders, it is necessary to shorten a hospital time by early treatment and rehabilitation.
3. Disabilities are relatively distinct but also interactive. It is necessary to break the vicious circle of interactive relations and use team approach.
4. Disabilities are influenced by environments, especially the human environment. It is effective to promote social action like environmental modifications.
5. There is an interaction between disability and personal factors. The rehabilitation model should value individual’s talent, ability and capability.
6. Disabilities are variable. It is necessary to allow for both recovery and recurrence.
7. The labelling of a mental disease contributes to social prejudice and discrimination. It is necessary to provide accurate information about disease and disability.

These characteristics and problems of mental disability are seen as factors that make treatment and rehabilitation of people with mental disability difficult (Utena, 1985). Discriminatory labelling is peculiar to mental illness. In the view of many observers, prejudice against those with mental illness lies at the root of resistance to accepting persons with mentally illness in the community (Lin, 1991).

According to the medical model, “disability” is a problem directly caused by a disease that requires medical treatment and care by professionals. According to the rehabilitation model, however, “disability” is an interaction between personal health conditions and the social environment to promote the quality of individual lives. Therefore, the management of mental disability requires comprehensive biopsychosocial approaches. The health care services should move away from a focus on disease and disability to a focus on activities in daily living and social participation of individuals.

IMMD: A Practical Rehabilitation Model of Mental Disability

Outline of the IMMD

The IMMD was proposed as a practical rehabilitation model (Yamane, 2000; 2001) to deal above-mentioned characteristics to mental disabilities and health care. The overall schema of the IMMD is depicted in Fig. 3. Table 1 contains the definitions of terms for the IMMD. The IMMD is a three-dimensional overall rehabilitation model of mental and physical functions, activities in daily living and social participation and the two contextual parameters of personal and environmental factors.

The IMMD is a practical rehabilitation model designed for team conferencing among professionals and interviews, and consultations with clients. It visualizes the characteristics and
problems of mental disabilities, especially the distinct and the interactive nature of the three dimensions of disability. It makes it clear that two contextual factors interact with all three dimensions of classifications. The model also shows that disability is not a consequence of disease, and that the labelling of a disease contributes to social prejudice and discrimination. For example, the prejudice against mental illness has made the provision of housing in the community extremely difficult.

The following explanations are meant to correct the definitions of the ICIDH-2 Beta-1 and Beta-2 Drafts. The term *Mind and Body Functions* indicates the body structure or physiological and psychological functions. The negative aspect of *Mind and Body Functions*, which was formerly *impairment*, indicates a loss or abnormality of body structure or physiological and psychological function at the level of body (biological organs and functions, including the brain). What is generally called *symptom* is synonymous with impairment. In addition, secondary dysfunctions, abnormalities, or both (e.g., side effects, decline in physical strength due to long-term hospitalization) should be included.

Table 1. Definitions of terms

<table>
<thead>
<tr>
<th>Common terms in a model</th>
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<tbody>
<tr>
<td>Mind and body functions</td>
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<tr>
<td>Activities in daily living</td>
</tr>
<tr>
<td>Social participation</td>
</tr>
<tr>
<td>Personal factors</td>
</tr>
<tr>
<td>Environmental factors</td>
</tr>
</tbody>
</table>

Terms used for the team conferencing work sheet and self-assessment sheet

| Housing and finances                     | Individual’s financial status and housing |
| Summary of treatment                     | Summary of all medical treatments (e.g., psychotherapy, medicine) |
| Summary of assessment                    | Summary of physiological and psychological functions, activities in daily living, social participation and so on |
| Family information                       | Family history, structure, membership, and relations |
| Focal problem                            | The most important and achievable target |
| Rehabilitation goal                      | Goal of rehabilitation team for medical treatment and support |
| Long-term goal                           | Goal to be achieved within six months (one year maximum) |
| Short-term goal                          | Goal to be achieved within one month (three months maximum) |
| Support Plan                             | Rehabilitation program, treatment period, method, etc. |
| Difficulties                             | The most difficult problems for client |
| Present hopes                            | Expectations of client: return to school, employment, making friends, etc. |
| Your goals                               | Goals of client |

Fig. 3. An Interactional Model of Mental Disability (IMMD) based on ICIDH
The term *Activities in Daily Living*, or functions at the personal level, is used in the broadest sense to capture every physical and mental activity that a person engages in at various levels of his/her daily living, such as grasping, walking, seeing, communicating, remembering, interacting with others and so on. The negative aspect of *Activities in Daily Living*, formerly *disability*, is represented by *Activity Limitations*, which are caused by disability and handicaps. Difficulties in any domain of an individual’s activities in daily living, and also lack of experience in life because of the disease should be included. Lack of experience includes: difficulties in daily social skills, family roles, occupational performance, and in utilizing social resources, interpersonal skills, or both.

The term *Social Participation*, one’s involvement in society, means the interaction between impairments and limitations in daily living activities and contextual factors (environmental factors, personal factors). The negative aspect of *Social Participation*, formerly *handicap*, is represented by *Participation Restrictions*, which are caused by impairments, disabilities and negative associations of the disease, serious deviant behavior of the person in the community arising from the interaction of impairments and environmental factors, or both. *Participation Restrictions* includes income limitations, restrictions on fundamental human rights and difficulties in seeking employment and public housing.

In the IMMD, the term *Disability* is used as a comprehensive term for all the negative dimensions of *Mind and Body Functions, Activities in Daily Living and Social Participation*.

*Environmental Factors* represent external influences on a person’s functions and are composed of components of the natural environment (e.g., weather), the human-made environment (e.g., community facilities, transportation), socio-cultural environment (e.g., rules and regulations, laws, attitudes, customs, institutions) and human environment (e.g., other individuals). *Personal Factors* represent internally influences on functions and comprise individual features, such as age, educational background, life experience, aptitudes, character, preferences, special abilities. In other words, the positive side of *Personal Factors* can be described as individual abilities including capabilities. These two contextual factors can be either participatory facilitators and inhibitors, and interact with one another.

**Conferencing work sheet and self-assessment sheet**

*Conferencing work sheet* (Fig. 4) and *Self-assessment sheet* (Fig. 5) have been designed for practical application of the IMMD. Both sheets have almost the same design to compare the recognition of the client with the assessment of the professionals. In the self-assessment sheet, some terms are changed to understand what the client is expecting and the problem perplexed him or her (e.g., difficulty, present hopes, your goal). In the top portion, there is a chronological table, where the events in the individual’s life (e.g., growth history, educational background, job career, present illness, hospitalization, and medical treatment) are entered. The chronological table helps the client to recollect his/her own life and experiences.

The conferencing work sheet is filled in by professionals and is used for team conferences among professionals. That helps to consider how and who to support the client in the professional team approach. The self-assessment sheet is filled in by clients. That shows how clients are recognizing themselves, relationships to environmental factors, and what the client is expecting. The self-assessment sheet is used to have a common goal with the client.

**Practical Application of the IMMD**

**Subjects and methods**

During a three-year period, we used the IMMD, conferencing work sheets and self-assessment sheets in three day-care facilities, two mental hospitals, one vocational aid center and one cooperative work place. We also surveyed professionals and patients about the utility of the IMMD.

Appendix 1 shows the outline of the
questionnaire. The purpose of question 1 was to determine whether the IMMD is useful for understanding a client’s mind and body functions and disabilities. Question 1 was rated on a five-point scale, and the Wilcoxon signed-ranks test was used to compare differences in the level of understanding of the client’s mind and body functions and disabilities before and after using the IMMD. Other questions were answered with yes or no, and the Chi-square test was applied to the
answers.

Results
We received answers to the questionnaire from 43 professionals and 64 patients (30 inpatients and 34 outpatients). Table 2 shows the comparisons of the levels of understanding before and after using the IMMD and the results of the Wilcoxon signed-ranks test, showing significant differences for the professionals group (p<0.01) and the outpatients group (p<0.01).

Table 3 shows the results of the questionnaire for professionals and analysis using the Chi-square test. The results showed significant differences for the team approach (p<0.05), for consensus among professionals (p<0.01), and for sharing goals with the client (p<0.01). However, no significant effect was seen in terms of shortening conferencing time.

Table 4 shows the results of the questionnaire for patients and analysis using the Chi-square test. The Chi-square test showed significant effects of consultation with professionals for both the inpatient and outpatient groups (p<0.01). In terms of setting their own goals, however, no significant effects were found on either the inpatient or outpatient group. Answers to the usefulness of

Table 2. Comparisons of levels of understanding before and after using the IMMD

<table>
<thead>
<tr>
<th></th>
<th>Professionals (N=43)</th>
<th>Inpatients (N=30)</th>
<th>Outpatients (N=34)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of understanding before using the IMMD (Mean ± SD)</td>
<td>2.326 ± 0.808</td>
<td>1.700 ± 0.702</td>
<td>2.000 ± 0.696</td>
</tr>
<tr>
<td>Level of understanding after using the IMMD (Mean ± SD)</td>
<td>4.070 ± 0.704</td>
<td>2.167 ± 0.913</td>
<td>3.529 ± 1.051</td>
</tr>
<tr>
<td>Corrected p-value</td>
<td>1.78707E-08 NS</td>
<td>0.00815**</td>
<td>1.02854E-06 **</td>
</tr>
<tr>
<td>Wilcoxon signed-ranks</td>
<td>**</td>
<td>NS</td>
<td>**</td>
</tr>
</tbody>
</table>

*, p<0.05; **, p<0.01; NS, not significant.

Table 3. Results of questionnaire for professionals (N=43)

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Chi-square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shortening of conferencing time</td>
<td>26</td>
<td>17</td>
<td>1.8837 NS</td>
</tr>
<tr>
<td>Usefulness for team approach</td>
<td>28</td>
<td>15</td>
<td>3.9302*</td>
</tr>
<tr>
<td>Usefulness for establishing consensus among professionals</td>
<td>30</td>
<td>13</td>
<td>6.7209**</td>
</tr>
<tr>
<td>Usefulness for having a common goal with a client (patient)</td>
<td>33</td>
<td>10</td>
<td>12.3023**</td>
</tr>
</tbody>
</table>

*, p<0.05; **, p<0.01; NS, not significant.

Table 4. Results of questionnaire for patients

<table>
<thead>
<tr>
<th></th>
<th>Inpatients (N=30)</th>
<th>Outpatients (N=34)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Usefulness for setting own goal</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Usefulness for understanding services provided</td>
<td>19</td>
<td>11</td>
</tr>
<tr>
<td>Usefulness for consultation with professionals</td>
<td>21</td>
<td>9</td>
</tr>
</tbody>
</table>

*, p<0.05; **, p<0.01; NS, not significant.
understanding the provided services were significantly more positive only in outpatient group (p<0.05).

Discussion

From our experience with the IMMD and the results of the questionnaire for professionals and patients, we found that the practical usefulness of the concept of IMMD to build a concrete base for team approach. The significant improvement of professionals' reported level of clients' understanding suggested the unique contribution of the IMMD to facilitate an overall and organized perspective of the client’s mind and body functions and disabilities. We assume that an overall shared understanding of a client became a factor to identify roles in team approach, to reach a consensus, and to establish shared goals with a client. Although the utilization of the conference sheets did not shorten a conferencing time by itself, it was expected that team members needed to become accustomed to using the work sheets as a shared communication frame.

The results of patients' survey evoked some questions to be studied in a future. Both inpatient and outpatient groups answered significantly positive for the usefulness of the IMMD work sheets for consultation with professionals, and not significantly negative nor positive for the usefulness for setting their own goals. This suggests that the IMMD may help clients to understand the different roles of professionals in terms of their practical needs but may not help to organize their own goals if professional help is not being provided based on their self-reported IMMD work sheet. This points out the importance of using the IMMD not only as an information-gathering tool but also as a communication process with a client. The result of outpatients showing positive usefulness of self-reported better understanding of their own conditions encouraged the future utilization of the IMMD to share a common goal with a client.

The non-significant changes of self-reported understanding level of self conditions among inpatients and the tendency of more negative answers to usefulness for setting their own goals should be studied more thoroughly in relation to therapeutic structures and milieu of long-term hospitalization.

The IMMD expresses the characteristics specific to mental disability and is a functional and user-friendly model. The IMMD and work sheets apply the concept of the ICIDH and ICIDH-2 to clinical in the psychiatric domain. Consequently, using the IMMD and work sheets may change the paradigm from seeing a person with mental disability as being a subject for medical treatment, to a person whom we live together with in the community.

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References


### Appendix 1. Outline of questionnaire

**For professionals**

1. Do you have sufficient understanding of the client’s mind and body functions and disabilities?
   - Level of understanding before using the IMMD
   - Level of understanding after using the IMMD
   - Insufficient 1-2-3-4-5 Sufficient

2. Has conferencing time been shortened? Yes No
3. Is the IMMD useful for the team approach? Yes No
4. Is the IMMD useful for establishing consensus among professionals? Yes No
5. Is the IMMD useful for establishing a shared goal with a client? Yes No

**For patients**

1. Do you have sufficient understanding of your own mind and body conditions and disabilities?
   - Level of understanding before using the IMMD
   - Level of understanding after using the IMMD
   - Insufficient 1-2-3-4-5 Sufficient

2. Is the IMMD useful for setting your goal? Yes No
3. Is the IMMD useful for understanding the services provided for you? Yes No
4. Is the IMMD useful for consultations with professionals? Yes No