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Interrelationship among Disablement, Socio-economic Status and Quality of Life of the Home-bound Disabled Elderly

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The purpose of this study was to clarify the relationships among disablement, socioeconomic status and QOL of the home-bound elderly. Data were collected from 56 chronically disabled elderly persons (mean age of 76.7 ± 9.7 years) who needed a long-term home-based care. They were assessed on QOL, activities of daily living (ADL) as well as socioeconomic condition. The QOL was evaluated by using Philadelphia Geriatric Center Morale Scale (PGC Morale Scale). The ADL and socioeconomic condition were evaluated by the Barthel index and the ESCROW profile respectively. These data were analyzed using Spearman's rank order correlation test. As a result, there was a negative relationship between the Barthel index score and the ESCROW score ($r=-0.554$, $P<0.01$). This negative relationship implies that the more one becomes independent in ADL, the better his socioeconomic status improves. It was also revealed that there was a significant relationship between the PGC Morale Scale score and the Barthel index score ($r=0.276$, $P<0.05$), and we found a negative correlation betweenthe PGC Morale Scale score and the ESCROW score (Social interaction ; $r=-0.386$ and Retirement status ; $r=-0.388$, $P<0.05$). These results suggest that in order to improve their QOL, ADL must be improved. Therefore, rehabilitation should be continued to maintain their function as soon as discharging from hospitals and facilities for rehabilitation. The results also indicate how the patient's independence in the daily life influences social and economic status, and consequently it affects the QOL.

Key Words

Quality of life (QOL),
Activities of daily living (ADL),
Socioeconomic status,
Community-based rehabilitation (CBR).

Introduction

The population of the aged is increasing rapidly, resulting in an alarming increase in the number of bedridden elderly in Japan. According to a 1992 survey conducted by Statistics and Information Department, Minister's Secretaries, Ministry of Health and Welfare of Japan, the number of the elderly who requires care is expected to reach 2.8 million in the year 2000, 3.9 million in the year 2010, and 5.2 million in the year 2025[1]. Consequently, the focus of rehabilitation has been shifting from hospitals and medical institutions to community-based rehabilitation (CBR) centers. The goals of CBR are to improve the quality of life (QOL) of disabled people and to help them function within their commu-

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nity.

This study was conducted to clarify the relationships among disablement, socioeconomic status and QOL of the home-bound elderly who need a long-term care service at home after discharging from hospitals and/or rehabilitation centers.

Materials and Methods

Fifty-six disabled elderly persons who were able to answer the questionnaire were surveyed. They consisted of 26 males (means age of 76.1 ± 8.3 years) and 30 females (mean age of 77.3 ± 11.0 years) and their mean age was 76.7 ± 9.7 years. The majority of recipients were persons with cerebral vascular accidents (53.6%) and the remainders were those with rheumatoid arthritis (12.5%), or with Parkinson's disease (5.4%). Subjective QOL, activities of daily living (ADL) and severity of handicaps were assessed.

ADL was assessed with respect to 13 items according to the Barthel Index (BI) modified by Granger et al[2] excluding the use of braces or prostheses.

In additions, the degree of handicap was evaluated using the ESCROW Profile (EP)[3]. This profile consists of 6 factors, and each was independently assessed and scored from 1 (most independent or best) to 4 (most dependent or worst). The 6 factors are Environment (suitability of housing location and arrangement), Social interaction (personal contact versus reliance on social agency supports), Cluster of family members (availability of competent family members to support the patient), Resources (financial situation), Outlook (general ability of the person to make decisions) and Retirement status (roles in the household or community; scored from 1 to 3). The sum of the subscores was assembled into ranges from 6 (best) to 23 (worst).

We assessed the subjective QOL of the subjects using the Japanese version of the Philadelphia Geriatric Center Morale Scale (PGC)[4] items from 1 through 17 translated by Maeda et al[5]. The PGC consists of four factors: the first affects optimism and positive outlook, the second affects psychological stability, the third affects the sense of health and usefulness, and the fourth affects attitude towards aging.

These data were analyzed using Spearman's rank order correlation test. The statistical significance was considered when a p value was less than 0.05. The data analyzed using a microcomputer soft "Statistica" (Stat Soft. Inc, Oklahoma, USA).

Results

1. Situation of the subjects

The average PGC score of the subjects was 11.5 ± 3.7. The subjects' average BI score was 58.4 ± 38.5, and thus, although not bedridden, their ADL was restricted to some degree. The average EP score was 10.8 ± 3.2, indicating that most subjects were not affected by a high degree of handicap.

2. Correlation between the severity of handicap and ADL

The correlation between the BI and EP scores illustrated in figure 1. These scores showed a strong negative relationship ($r=-0.554$), and statistical significance was found according to Spearman's rank order correlation coefficient ($p<0.01$). The total BI scores had strong negative relationship with environment, social interaction, outlook and retirement status in the six EP factors ($r=-0.454$~-0.741,

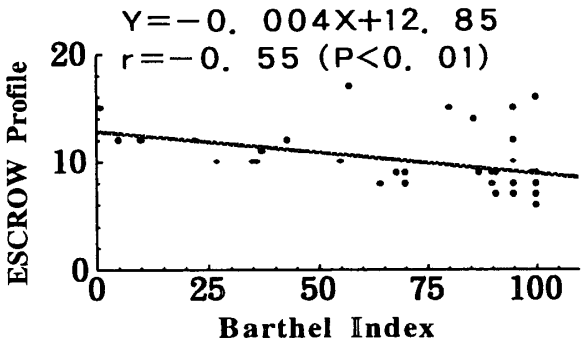

Figure 1. The correlation between the BI and EP scores.
These scores showed a strong negative relationship (r=−0.554), and statistical significance was found according to Spearman's rank order correlation coefficient (p<0.01).

p<0.01) (Table 1).

3. Effect of independence in ADL on QOL

Total QOL score was significantly affected by the degree of patients' independence in ADL, and those with independent ADL showed higher QOL score (p<0.05).

The total BI score had a significant relationship with the first factor (affects optimism and positive outlook) and the fourth factor (affects attitude towards aging) in the four PGC factors (p<0.05).

The relationship between each BI activity and each PGC factor revealed that, statistical significant relationship was observed between the first PGC factor and such activity as drink from cup, wash or bathe and excretion, and the third factor and such activities as dress upper body, dress lower body, bowel continence, sitting on a chair, going to the bathroom, taking a bath and climbing stairs, the fourth factor and all activities of except for two activities (excretion and walking on a flat surface) (p<0.05) (Table 2).

4. Correlation between the severity of handicap and QOL

No significant relationship was found between the total EP scores and the total PGC scores. However, the total PGC scores had a negative relationship with social interaction (r=−0.386, p<0.01) and retirement status (r=−0.388, p<0.01).

Table 1. Correlation between the severity of handicap and ADL

Barthel Index	ESCROW Profile						
	E	S	C	R	O	W	Total
Drink from cup/feed from dish	-0.286*	-0.353*	-0.209	-0.087	-0.283*	-0.380*	-0.504**
Dress upper body	-0.503**	-0.404**	0.083	0.003	-0.324*	-0.486**	-0.492**
Dress lower body	-0.503**	-0.414**	0.095	0.038	-0.376*	-0.485**	-0.492**
Grooming	-0.456**	-0.216	0.161	0.003	-0.349*	-0.347*	-0.343*
Wash or bathe	-0.612**	-0.456**	0.094	-0.039	-0.337*	-0.444**	-0.335*
Bladder continence	-0.578**	-0.254	0.155	-0.004	-0.435**	-0.465**	-0.467**
Bowel continence	-0.523**	-0.345*	0.196	0.026	-0.514**	-0.456**	-0.462**
Care of perineum/clothing at toilet	-0.632**	-0.302*	0.258	0.176	-0.446**	-0.332*	-0.377*
Transfer, chair	-0.582**	-0.301*	0.253	0.159	-0.498**	-0.387*	-0.419**
Transfer, toilet	-0.625**	-0.230	0.046	0.025	-0.778**	-0.336*	-0.437**
Transfer, tub or shower	-0.594**	-0.367*	0.087	0.062	-0.337*	-0.354*	-0.317
Walk on level 50 yards or more							
Wheel chair/50 yards-only if not walking	-0.649**	-0.290	0.066	0.069	-0.458**	-0.326*	-0.357*
Up & down stairs for one flight or more	-0.571**	-0.228	0.318	0.189	-0.301*	-0.286	-0.215
Total	-0.741**	-0.454**	0.151	-0.003	-0.552**	-0.515**	-0.554**

*:p<0.05 **:p<0.01

E:Environment, S:Social interaction, C:Cluster of family members, R:Resourcers, O:Outlook, W:Retirement status

Negative correlation was observed between the first PGC factor and social interaction (r=–0433, p<0.01), and retirement status (r=–0.324, p<0.05), and the second PGC factor and resourcers (r=–0.419, p<0.01), and third PGC factor and retirement status (r=–0439, p<0.01), and the fourth PGC factor and environment (–0.34, p<0.05), and social interaction (r =–0.566, p<0.01). But cluster of family members and outlook was not always associated with their PGC factors. (Table 3).

Table 2. Effect of independence in ADL on QOL

Barthel Index	Factors of PGC morale scale I	II	III	IV	Total
Drink from cup/feed from dish	0.368**	0.097	0.076	0.380**	0.329*
Dress upper body	0.223	0.027	0.289*	0.489**	0.284*
Dress lower body	0.250	0.046	0.328*	0.528**	0.316*
Grooming	0.267	-0.042	0.263	0.428**	0.254
Wash or bathe	0.295*	-0.080	0.217	0.367**	0.257
Bladder continence	0.319*	-0.121	0.243	0.233	0.234
Bowel continence	0.290*	-0.116	0.286*	0.307*	0.241
Care of perineum/clothing at toilet	0.254	-0.171	0.223	0.399**	0.214
Transfer, chair	0.261	-0.052	0.323*	0.388**	0.274*
Transfer, toilet	0.227	-0.126	0.156	0.357**	0.184
Transfer, tub or shower	0.256	-0.141	0.280*	0.320*	0.213
Walk on level 50 yards or more					
Wheel chair/50 yards-only if not walking	0.084	-0.299	0.061	0.225	0.003
Up & down stairs for one flight or more	0.227	-0.101	0.276*	0.360**	0.200
Total	0.302*	-0.110	0.270	0.463**	0.276*

*:p<0.05 **:p<0.01

I : first factor II : second factor III : third factor IV: fourth factor

Table 3. Correlation between the severity of handicap and QOL

ESCROW Profile	Factors of PGC morale scale I	II	III	IV	Total
Environment	-0.174	0.064	-0.209	-0.340*	-0.210
Social interaction	-0.433**	0.029	-0.152	-0.566**	-0.386**
Cluster of family members	-0.130	0.081	0.123	-0.142	-0.032
Resourcers	-0.108	-0.419**	-0.009	0.151	-0.163
Outlook	-0.175	-0.162	-0.172	-0.227	-0.247
Retirement status	-0.324*	-0.053	-0.439**	-0.297	-0.388**
Total	-0.227	0.028	-0.142	-0.291	-0.241

*:p<0.05 **:p<0.01

I : first factor II : second factor III : third factor IV: fourth factor

Discussion

Rehabilitation programs attempt to begin as soon as possible after the onset to reduce impairments and disabilities, and ideally, the long-term follow-up care is ideally needed in order to improve their levels of function to the maximum after discharge from the hospital. Improvement of levels of function, reduction of degree of handicaps and acquirement of higher quality of life are the essential and intrinsic goal of the rehabilitation process for home-bound elderly patients.

This study was to clarify the relationships among disablement, socioeconomic status and QOL of the home-bound elderly.

The present study showed a negative relation between the Barthel and the ESCROW scores. This negative relationship implied that the more one becomes independent in ADL, the better his socioeconomic status improve. Fortinsky[6] states that there is a significant correlation between both scores, if a lower Barthel score is related, on the average, to lessened ability to make decisions easily (Outlook) and to decreased ability to fulfill usual and customary roles (Work status). Our study also reveals that the higher Barthel score, the better, living environment, social interaction, outlook, retirement status (roles at home or within the community). In the present study, however, items of the ESCROW profile such as cluster of family members and resources were not always associated with their Barthel scores. Generally speaking, for the disabled persons, living environment, support to functioning for daily living in the home by their families and their financial situation are important factors influencing ADL. But in the cases of the home-bound elderly persons, their ADL was determined by not only living environment, but also social interaction and roles at home and/or within the community. Therefore, social supports were more necessary among people lost social interaction and social role in living poor house with major architectural and economic problems. However, so far in Japan, the systematic formal and informal social support have not yet been established through definitive study. And it is not exaggerated to say that home care heavily relies upon family functioning and the use of social resources has not yet developed.

In current Europe and United States, as for the ADL, there were much thought considered as a constitution of QOL when QOL were evaluated[7,8]. According to Guyatt et al, in particular, ADL were a major domain of QOL in the elderly persons with disease[9]. Ahlsio et al[10] and Chino et all[11] stated that physical ADL scores were in most proportion to subjective QOL scores, and physical ADL is one of the predicting factor of subjective QOL[12]. In addition, Fujita et al[13] found that the QOL levels of the healthy older people were higher, if they were on the higher activity level. Naturally, the QOL of the elderly with a lower independence in ADL has been shown to be lower than that of the elderly with a higher independence in ADL[14]. Our study also revealed that QOL was significantly higher for those patients with a higher degree of independence in ADL, in agreement with these previous studies. This finding implies that ADL was a major domain of QOL in the home-bound elderly who need a long-term care service at home after discharging from hospitals and/or rehabilitation centers, and their QOL is strongly influenced in their functional in-

dependence. Therefore, physical ADL evaluation is one of important evaluation methods to predict QOL. Thus, in order to improve the QOL of the disabled elderly patients who are confined to home, the independence in ADL of patients must be improved. In other words, higher QOL leads to aggressiveness of the daily living activities, and it can be contributed to the prevention of disuse syndrome such as muscle atrophy and joint contracture.

Analysis of the relationship between each activity of BI and each PGC factor revealed that the degree of satisfaction for the fourth factor (affects the attitude towards aging) was significantly higher, if the patients have a higher degree of independence in excretion and walking on a flat surface. Furthermore, when the degree of independence for performing such activities as sitting on a chair, going to the bathroom, taking a bath and climbing stairs was high, the degree of satisfaction for the third factor (affects the sense of health and usefulness) was significantly high. This emphasizes that to increase the degree of satisfaction regarding the attitude towards aging and to improve their confidence in the health and usefulness of elderly patients, in particular their transfer functioning in ADL must be improved. Naturally, to improve the QOL of elderly patients who are confined to home, they should be encouraged to go out and socialized. It leads to increasing of the social interaction and roles at home or within the community in ESCROW factors. As stated by Fukuya[15], it is important to ensure the transfer functioning of elderly patients, by utilizing whatever means available. Elderly patients should be encouraged to interact with people even when he or she is confined to a wheel chair, or to get to the room where other family members gather even if the patient has to move by prone kneeling or kneeling. Furthermore, if functional disorders and ADL can not be improved, the lifestyle of the patient should be altered. For example, when an elderly patient spends most of his or her day in the living room, arrange him or her to the place from where the streets can be looked on easily so that the patient can have social interaction and stimulation.

As for the factors affecting psychological stability, Maeda et al[5] suggested that their degree of satisfactory of psychological stability correlated significantly with their physical functioning. However, we found no significant correlation between their psychological stability and each activity of BI. The physical disability should be one of important factors influencing their psychological stability. But in the case of the home bound elderly disabled, their psychological stability might be determined by the acceptance of handicap by them as well as their family members and their situation of the people around them than degree of their physical disability.

The QOL correlates to social factors, such as family member, marriage, interpersonal relationships and visits with neighbors as reported by Fujita et al[13]. The results of the present investigation on the relationship between disabilities and QOL showed that the higher the PGC score, the significantly lower the scores for social interaction and roles at home or within the community. But items such as cluster of family members and out–look were not always associated with their QOL. It is natural that the social functioning and social support by their families should be one of the important factors influencing QOL and

ADL[12,16]. But in the cases of the home-bound elderly persons, their QOL was determined by not only social interaction, but also roles at home or within the community. This suggests that the QOL of the elderly was determined by social factors, such as social interaction or social roles. If social interaction was diminished, elderly patients tend to stay home and rely more on their family members, thereby losing their role at home and subsequently reducing their QOL. This emphasizes that to increase the QOL of these people, their opportunities for social interaction must be increased, so that their social roles can be maintained. Psychological support should also be provided to patients so that their opportunities for social interaction and social roles increase.

Ahlsio[10] and Granger[3,17] state that individual quality of life depends upon his or her ADL capacity as well as social and economic status. In our study, the relationship between the PGC and ESCROW (social interaction and retirement status) scores, and ESCROW and Barthel scores showed a negative relationship. PGC score was significantly affected by the degree of patients' independence in ADL (Barthel score). This may imply that the individual ESCROW profile as well as the Barthel score also reflect his qualityof life.

As a conclusion of this study, QOL of the home-bound disabled elderly patients depend on level of ADL and socioeconomic status, though QOL is not influenced by these factors alone. This kind of study could be necessary to establish an appropriate home-care program in response to the criticism that this type of service has not been scrutinized for its effectiveness. It is thought that QOL of the home-bound disabled elderly patients need to be analyzed how it is affected by their living environment or social environment in future.

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