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A COMPARISON BETWEEN AN EXPERIMENTAL AND TRADITIONAL REHABILITATION PROGRAM FOR SPINAL CORD INJURED PATIENTS RELATIVE TO REHABILITATION SUCCESS, PATIENT'S SELF-ESTEEM, AND ECONOMIC COSTS.
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ABSTRACT

A COMPARISON BETWEEN AN EXPERIMENTAL AND TRADITIONAL REHABILITATION PROGRAM FOR SPINAL CORD INJURED PATIENTS RELATIVE TO REHABILITATION SUCCESS, PATIENT'S SELF-ESTEEM, AND ECONOMIC COSTS.

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This study investigates the long-term effectiveness of an experimental rehabilitation program on spinal cord injured patients three or more years after discharge from the program. This is accomplished by comparing patients from this experimental program to those from an ongoing traditional rehabilitation program. Ten patients in each group were interviewed, asked to fill out a questionnaire, and observed in their homes. Medical and financial records covering their stay in their respective institutions were also reviewed.

The following data were collected and analyzed: (1) measures of program success generally associated with a traditional rehabilitation program, including physical, social, psychological, and vocational parameters; (2) measures of patient self-esteem; (3) patient evaluations of the usefulness of the services offered in their

respective rehabilitation programs; (4) measures of physical skills of each group at admission, discharge, and follow-up; and (5) financial data on each rehabilitation admission and on other hospitalizations.

Three formal hypotheses are tested:

Hypothesis 1: Patients from the experimental group demonstrate better performance on traditionally-defined rehabilitation skills, as measured by their responses on the Modified Smits Rehabilitation Success Scale, than do patients from the traditional group.

Hypothesis 2: Patients from the experimental group demonstrate a higher level of self-esteem, as measured by their responses to the Modified Rosenberg Self-Esteem Scale, than do the patients from the traditional group.

Hypothesis 3: Patients from the experimental group will find greater usefulness in their program in the transition from hospital to home than traditional patients will find in theirs, as measured by their responses of both groups on the Rehabilitation Services Usefulness Scale.

In addition to testing these formal hypotheses, the study compares selected demographic characteristics, physical performance skills, and costs of rehabilitation.

Conclusions drawn from the analysis of the data are:

1. There are no differences between the two groups relative to traditional criteria for rehabilitation success: thus, the experimental program was successful in providing all the rehabilitation skills made available in a traditional program.

2. There are no differences between the groups relative to the patient's self-esteem: thus, the experimental program instilled in its patients as high a regard for themselves and their abilities as did the traditional program.

3. The experimental group patients find greater usefulness in their program in preparing them for life away from the hospital than do traditional group patients in a traditional program.

4. The experimental program is more successful in stimulating patients to perform at high levels of independence, both physically and socially, than is the traditional program.

5. As compared to the traditional hospital program, the experimental program is more financially effective: i.e., it costs less per day, requires fewer days, and results in fewer readmissions to the hospital.

Therefore, the experimental program is found to be useful by its patients, stimulates them to high levels of independent living, and is financially effective.

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CHAPTER I

INTRODUCTION

The trend in rehabilitation programs is to combine health professionals into groups to better define and address patient problems (Policoff, 1971). This is especially true for those serving the severely physically disabled. Rehabilitation personnel work with community and government agencies and other resources in order to assist the disabled patient to regain the ability to function in the home, family, and community. However, despite concerted efforts by medical and vocational rehabilitation professionals, patients continue to be recycled through hospitals and vocational training centers. Many are still not able to maintain themselves nor assimilate into family or community life in a productive way (Abramson, 1968, Buck et al., 1970).

In an attempt to address these problems, an experimental rehabilitation program was initiated in 1968 by the Michigan Vocational Rehabilitation Services Department and a university hospital department of physical medicine and rehabilitation. The program was designed to provide severely disabled persons with the skills needed

to live with a style and quality they, the patients, felt was acceptable and worthwhile. The medical, social, and vocational processes of rehabilitation were combined into one program with the expectation that this approach would enhance the disabled person's chances of learning and maintaining those skills necessary to function outside the hospital environment.

The purpose of this study will be to compare the respective impacts of the experimental program and the traditional program on patients three or more years after discharge. This will be accomplished by: (1) identifying demographic characteristics of each program's sample to determine if there are obstacles that would inhibit the task of learning and maintaining independent living skills; (2) examining a sample of each program's patient population to ascertain whether or not the criteria of success generally associated with a traditional rehabilitation program were met; (3) reviewing each patient sample to determine if positive perceptions of self-esteem currently obtain; (4) assessing patient perception relative to the usefulness of their rehabilitation program to return them to a productive and meaningful life; and (5) determining the comparative costs of each program.

There are several reasons why this type of research is important. The loss of an individual's opportunity to participate in the mainstream of life is tragic. It is

difficult to put a quantitative value on the social and qualitative aspects of living. Without some productive or meaningful purpose, life can deteriorate to a level of poor quality and in some instances seem worthless. This is more likely to occur when a severely disabled person has no independent living skills. In such a situation there is great potential for family disruption and reduction of the resources and opportunities for productive living. A rehabilitation program that would enhance a severely disabled person's chances to maintain or recover independent living skills and feelings of self-esteem and self-worth would be of benefit to disabled individuals, their families, and society.

The economic consequence of disability must also be considered. The enormous cost of maintaining severely disabled persons who are totally dependent makes it important to learn which aspects of rehabilitation programs contribute to the acquisition and maintenance of living skills that will enable independence. The physically disabled portion of the population is increasing for several reasons. Modern medical and surgical advances are saving many patients who previously would not have survived their disease or injury, people are living longer and are susceptible to more disabling conditions, and recreation and transportation accidents are increasing. These are chronically diseased or impaired people--26 million

non-institutionalized in this country in 1972--who are in need of effective rehabilitation services (Wilder, 1972). Clearly the disabled portion of the population is a major one and is making a significant demand on the health care resources of the nation.

The total costs of care for the disabled include those for the initial hospitalization and rehabilitation services, repeat hospitalizations for complications, repeated rehabilitation attempts, compensation for lost work, household support, and nursing home care. In addition, there is lost revenue from taxes never collected on wages never earned by the dependent disabled, or by family or relatives that are unable to be gainfully employed because of the need to provide home care for the disabled. When the increasing numbers of surviving disabled are multiplied by these dependency costs, the impact of successful rehabilitation programs can be economically appreciated (Thomas, 1974).

It is also clear that those who are severely and chronically disabled utilize a large portion of the available health services. Many visits to physicians' offices and hospitals could be avoided if the disabled and their families were given the necessary information and skills to make decisions as to when the use of medical services is appropriate. The necessary information and skills are neither esoteric nor complicated. Better

informed patients would more efficiently utilize rehabilitation personnel and subsequently would promote greater efficiency in the health care delivery system (Erdman, 1970).

Finally, it is important to complete this study for the rehabilitation profession itself. There is a need for information that will indicate whether or not a discrepancy exists between the assumed and proven effectiveness of the educational programs in rehabilitation. Determination of the congruence between the goals and outcomes of the experimental program would provide some guidance for rehabilitation curriculum planning.

There are several generalizations that could follow from this work. The study could contribute to evaluation practices of other rehabilitation programs. First, methods and instrumentation might be employed for self-study. This is particularly important since there are very few rehabilitation program evaluation models currently in use which employ multiple variable measures.

Second, concepts used in the experimental program seem transferable to other rehabilitation units and to settings other than those found in a large university hospital. Third, the study provides the basis for continued investigation into the educational preparation of rehabilitation personnel which could be pursued by: (1) identifying the impact of the experimental program on

those students who participated in the program and how they practice rehabilitation as a result; (2) verifying how those students differ from others in their practice of rehabilitation; (3) identifying those skills that the patient population finds most helpful in the rehabilitation effort; and (4) verifying whether or not they are included in rehabilitation program curricula. Such information could directly benefit rehabilitation program curriculum planners.

It is important to note the limitations of the study. It could not be expected to be a definitive method of evaluation for all rehabilitation units. Also, the exact techniques used in implementing the experimental program may not be appropriate without modification for different populations in different geographical locations. Additionally, it might not be applicable to non-medically oriented disabilities and their associated problems. Finally, the measures were obtained on one severely disabled group--spinal cord injured--and transferability to other groups is not empirically tested in this study.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

A variety of parameters of patient performance have been evaluated to determine the success of medical rehabilitation programs. The literature that is reviewed describes previous work with these variables, and demonstrates the absence of agreed upon definitions and measures of rehabilitation success. The parameters that will be discussed include: (1) family support, (2) vocational outcome, (3) cost-benefit factors, (4) self-care, and (5) multicriteria.

Family Support

The family has been the focus in some rehabilitation research. Litman (1966) reports the supportive role of the family as important in his study of one hundred disabled patients. This population included all the patients on the rehabilitation service during a selected fifteen-month period except for those with moderately severe to severe brain damage. All patients were evaluated throughout their program and each had one intensive psychosocial interview. Each patient was also given the

Jansen-Hill Family Integration Scale which measures eight areas of family life. All those who scored above the mean on this scale and had corroborative social histories were said to have solid family situations. Of the patients who did not meet the expectations of their rehabilitation programs, 76.6% (23) lacked family support. Of those patients who did respond well to the rehabilitation program, 72.8% (51) were judged to be in strong family situations. Family ties also enhanced performance. Patients who anticipated going back to a family unit had better performance scores. Of those who demonstrated good response to rehabilitation, 64% (64) returned to a family situation.

McDowell (1976) found that when good educational programs were carried out with the family, the number of stroke patients able to return home and function adequately increased sharply. Lehman et al. (1975) agree, having reported that in their study of stroke patients the amount of family support and involvement as indicated by the presence of a spouse predicted disposition. As support and involvement increased, the number of patients that were able to live at home increased.

A study by Slater et al. (1970) analyzed the relationship between premorbid participation in household activities and improvement in mobility and self-care skills. Interviews with the 69 patients and their

families were conducted during hospitalization and at six-month intervals up to five years after discharge. The patients who met the criterion of living with an adult relative were selected from a random sample of 208 patients in a rehabilitation hospital. The authors concluded that those who were more active in the family unit before the disability occurred achieved a higher level of self-care and mobility skills than those who reported being less active. The authors further feel that household participation is a measure of the involvement of the patient in the family unit, and that those who had higher levels of participation are valued more highly by their families and, in turn, value their return to the family more. In addition, disability and dependence forces one out of the adult role into a state of child-like dependence upon others. An added incentive therefore for the patient to attain self-care independence is the ability to resume the previous adult role. Once gained, this independence reduces stress on family roles and increases chances of rehabilitation success. They comment that, overall, the family situation probably has more to do with rehabilitation success than do the patient's individual characteristics.

Kemp and Bash (1971) conclude that the availability of interpersonal support was important in their follow-up study of 50 spinal cord injured patients. The

quadriplegic patients did as well as the paraplegic patients when they had good support, but performed much poorer without that support.

Abramson (1968) studied 210 patients who were randomly assigned to experimental and traditional rehabilitation groups. The experimental group included participation by both patient and family in planning, educational, and training sessions, and in team conferences. One of the noticeable results of this effort was a maintained or increased level of family visitation during hospitalization for the experimental group, and a constantly decreasing level for the control group. In the follow-up period one year later, the experimental group was considerably more socially active than the control group although both groups had declined somewhat.

Finally, in his follow-up study of 260 disabled patients three years after discharge, Smits (1974) found a significant positive relationship between success in rehabilitation and a close, supportive family which encouraged independence. He reported family response to disability as crucial to success and recommended substantial investment in efforts to educate the patient's family.

In summary, this portion of the literature review suggests that family involvement and treatment in rehabilitation programs for the medically disabled is an

important component of the patient's program. The presence of this component in a rehabilitation program therefore would seem to be a necessary criterion of a program's adequacy.

Vocational Outcome

Other program evaluation efforts have used vocational outcome as a measure of the adequacy of a rehabilitation program. For example, Trigiano and Mitchell (1970) reported that, in a group of quadriplegics, 25% (14) of the 56 patients surveyed were either working or in college. Kemp and Bash (1971) in a five-year follow-up study of 50 spinal cord injured (25 paraplegics and 25 quadriplegics) found 4% (2) working part time, 28% (14) working full time, and 8% (4) in school. This was a selected group between the ages of 15 and 55, who lived within 50 miles of the rehabilitation center, and each of whom had a traumatic, complete lesion.

In a study of the employment records of 219 spinal cord injured veterans who had received rehabilitation services from a Veterans Administration program, Deyoe (1972) reported that 14% (40) were employed full time and 10% (22) were employed part time. All patients were at least one year post discharge. He also noted that, of the 24% (62) employed, 11% (34) were self employed.

Rosenthal (1966) evaluated 32 spinal cord injured before discharge, and felt that 75% (24) were capable of employment or educational activities. However, a follow-up of these patients after discharge from this inner city rehabilitation unit showed that only 4% (1) were employed and another 17% (4) were in school. Weisbroth et al. (1971) studied 62 stroke patients under 65 years of age and found that 37% (23) returned to work. This population did not include housewives nor those with diagnosed progressive degenerative disease. An average of 11.9 months of vocational counseling was required in order for the patients to be successfully placed, and over 50% had to accept a new occupational role.

Waylonis et al. (1970) caution that evaluations of stroke populations may skew any rehabilitation program employment figures because of the advanced age and high mortality rate of that particular population. In their review of 100 stroke patients in a community hospital rehabilitation unit, 90% were retired or unemployed prior to the onset of their stroke.

In a study of 45 patients with chronic obstructive pulmonary disease, Lustig et al. (1972) found that 73% (11) of those in the rehabilitation program were back at work six weeks after discharge from the program and were often able to procure better jobs than they had previously. Those in the control groups ("no treatment" and

"psychotherapy only") demonstrated significantly fewer successful vocational activities: only 23% (7) were back at work six weeks after discharge.

The preceding studies, all of which used employment as one indication of rehabilitation success, are summarized in Table 1.

In contrast, Zelle and Taranto (1976), in their work with a chronically disabled group, concluded that being employed is not being rehabilitated. Data on 213 mentally and physically disabled persons 6 to 36 months after they had been considered to be successfully vocationally rehabilitated showed that all had been working full time at closure of the case by vocational rehabilitation, but 43.6% (93) were either unemployed or working less than full time when surveyed. A medical consultant reviewed a random sub-sample of 62 of those cases and felt that all were able to work full time. However, only 38.7% (25) were doing so. Zelle and Taranto conclude that, "it is false to assume that placement is the sole criterion of successful rehabilitation" (1976, p. 290).

Smits (1974), Abramson (1968), and Glick and Singer (1973) agree. Their studies indicate that, while certainly possible and desirable for some disabled persons, employment is not an adequate measure in itself for success in rehabilitation.

TABLE 1.--Summary of Vocational Outcome Studies.

Study	Disability	Percent Employed*	Years Post Discharge
Trigiano and Mitchell (1970)	Quadriplegics	25% (14)	?
Kemp and Bash (1971)	Spinal cord injured	40% (20)	5 years
Deyoe (1972)	Spinal cord injured	24% (62)	1 year
Rosenthal (1966)	Spinal cord injured	21% (5)	1 year
Weisbroth (1971)	Stroke	37% (23)	1 year ?
Lustig et al. (1972)	Pulmonary disease	73% (11)	6 weeks
Dvonch et al. (1965)	Spinal cord injured	28% (30)	1-30 years
Glick and Singer (1963)	Mixed	0	3-4 years

*Includes those working part time and those in school.

Cost-Benefit Factors

Cost-benefit factors have also been used as a criterion for program success. Lehman (1974, 1975) noted that, although expensive, rehabilitation efforts save substantial amounts of public and private dollars. In his follow-up study of 114 patients at the University of Washington, the cost-benefit analysis indicated that average rehabilitation costs per patient equal the patient's nursing home costs for 21.5 months. However, stroke patients live for an average of 51.2 months following their stroke. Therefore, the cost of almost 30 months of nursing home care is saved by rehabilitating the patients. He further reports that, "cost accounting analyses have shown time and time again that rehabilitation programs survive well on a cost accounting basis with significant savings for dollar invested in treatment" (1974, p. 2).

The work of Kottke (1971) supports Lehman's findings. He reports that only 5% of stroke patients who receive rehabilitation services remain completely dependent, and require full nursing services. Even if the rehabilitated stroke patients are not fully independent, they can usually be discharged to their homes, rather than to a nursing home where the cost for those requiring full care is $35-50 per day. Currently, this could result in a savings of from $13,000-18,000 per year, for each patient.

Erdman (1970) comments that investigations have shown that, for every dollar spent on rehabilitation, the employed disabled person returns more than $8.00 to the economy. Smits' (1974) survey of 141 former rehabilitation patients shows that 50% (70) were receiving no form of disability compensation. For this group, the favorable direction of the cost-benefit factor is again obvious.

Lehman (1974) notes another area of cost benefit in his review of a study of severely disabled patients by the Liberty Mutual Insurance Company. He stated that there was a savings of $50,000 per patient in treatment costs when treatment was provided by a rehabilitation service rather than by a community hospital. In related work, Fowler (1973) also notes that rehabilitation programs can return one-third of severely disabled (quadriplegic) adult males to work, one-third to a level of independence that releases another person for employment, and only one-twentieth to custodial care. The savings in dollars not spent in caring for completely dependent patients is evident.

The following table summarizes the cost-benefit figures of the previously noted studies.

Although cost saving is one measure of value of rehabilitation programs, this dissertation maintains that cost-benefit factors alone cannot be accepted as an adequate index for program evaluation. Another factor

TABLE 2.--Summary of Cost-Benefit Factor Studies.

Study	Disability	Benefit of Rehabilitation
Lehman (1974, 1975)	Stroke	Reduces cost relative to nursing home care. $45,000 over lifetime.
Kottke (1971)	Stroke	Savings of $13,000 to $18,000 per year per patient relative to nursing home care.
Erdman (1970)	Mixed	Rehabilitation benefit of $8.00 per each $1.00 spent.
Smits (1974)	Mixed	50% of rehabilitation patients receive no compensation money.
Lehman (1974)	Mixed	Savings of $50,000 per patient relative to community hospital cost.
Fowler (1973)	Quadriplegics	If rehabilitated only 5% require total care, 33% work, and 33% able to care for self.

that must be examined is the ability to improve patients' physical functioning in areas such as self-care and mobility.

Self-Care

Abramson (1968) evaluated 210 patients at admission, discharge, three months post discharge, and one year post discharge for evidence of gains in independence in self-care and ambulation. Although the control group was physically less disabled and made significantly greater progress in self-care and ambulation during hospitalization, they had lost the skills to a significant degree at the one-year post-discharge follow-up. In contrast, the experimental group continued to gain in skills and were significantly better at the one-year post-discharge follow-up. A comparison of the predicted and achieved levels of skill is even more striking. The control group failed to meet predicted achievement in independent living and employability, while the experimental group exceeded its predictions.

Glick and Singer's (1963) follow-up of the 49 rehabilitation patients discharged from a chronic disease unit during one calendar year revealed that, three to four years post discharge, 67% (16) of the patients were functioning at levels below their optimum. Home interviews with 25 patients selected to reflect the disability

distribution of the population showed that in two skill areas, ambulation and bathing, 46% (11) were performing at below expected levels. In four areas--transfers, feeding, dressing, and toileting--68%-80% (17-20) of the patients were performing at expected levels. The experience of setting foot outside the home was never accomplished by 28% (7), and only rarely by 16% (4). Furthermore, only 12% (3) progressed to the point of sitting on the porch. This means that 56% (14) were totally confined to their homes or apartments.

A study of disabled patients by Slater et al. (1970) suggests that most patients gain their highest skill level during hospitalization. Although 25.4% (15) achieved self-care independence after being discharged, 49.2% (29) achieved that goal during their in-hospital rehabilitation program. Kelman et al. (1966) followed 60 elderly, chronically disabled patients over two years. In general they found that the patients maintained their self-care skills; however, they had a high incidence of rehospitalizations (57 for 32 patients in two years). Advanced rheumatoid arthritics were the subjects of a follow-up study done by Karten et al. (1973) to determine the impact of a therapeutic community situation in maintaining rehabilitation skills. They followed 101 patients over a five-year period, with evaluation at admission, discharge, three months post discharge, and then yearly.

At a mean follow-up time of 20 months after discharge, 73% (53) of the survivors had improved in their functional skills. Of the original "group of 101 patients, 53 showed improvement that was maintained throughout the follow-up period" (1973, p. 123). In several other studies with rheumatoid patients, a comprehensive rehabilitation program has led to decreased deterioration in self-care performance levels. These programs were characterized by their continuing contact with their patient populations (Duff et al., 1974; Katz et al., 1968).

Waylonis et al. (1973) describe a one-year follow-up of a stroke rehabilitation program which included 118 control patients and 124 treatment patients. The treatment group was seen by a comprehensive team and the control group was not. Good achievement of independent function was shown in various self-care skills, 56-75% (39-52) at one-year follow-up evaluations by the 69 survivors of the treated group. The studies of Grant and Cohan (1973) on cardiac rehabilitation, and Lustig et al. (1972) on pulmonary disease rehabilitation, also cite significant improvement in self-care skills as evidence of the worth of rehabilitation programs.

Buck et al. (1970) report on a program set up in Texas to provide continuing service to patients discharged from rehabilitation centers. The rationale for the

initiation of the program was their repeated finding of increased dependence of patients upon others after discharge.

Moskowitz et al. (1972) did a follow-up study of 518 stroke patients who had been discharged from rehabilitation units in a three-county area for one month to ten years. Their findings show that skills tend to decline after discharge due to further physical deterioration or failure to maintain equipment. Only 32% of the patients were completely independent and required no assistance during the day or night. They conclude that basic medical care is not the problem; it is, rather, the long-term management of disabilities found in chronically diseased or injured patients.

Table 3 summarizes these previously noted studies.

Multicriteria

As these examples have shown, improvement in the ability to function in mobility and in caring for personal needs, vocational placement, cost-benefit factors, and family involvement all have been used to evaluate the success of rehabilitation programs. However, rehabilitation programs have many and varied objectives. Chapter I indicated the bias of the author as to the necessary conditions that must be satisfied in order for a program to be fully evaluated. Unfortunately, the literature on

TABLE 3.--Summary of Self-Care Studies.

Study	Disability	Skills Maintained	Years Post Discharge
Abramson (1968)	Mixed	Control - No Experimental - Yes	1 year
Glick and Singer (1963)	Mixed	Overall - No Some skills - Yes	3-4 years
Slater et al. (1970)	Mixed	Most patients gain highest skill level during hospitalization	5 years
Kelman et al. (1966)	Mixed	Yes	2 years
Karten et al. (1973)	Rheumatoid arthritis	Experimental program - Yes	5 years
Katz et al. (1968)	Rheumatoid arthritis	Control - No Experimental - Yes	1 year
Waylonis et al. (1973)	Stroke	?	1 year
Buck et al. (1970)	Mixed	No	?
Moskowitz et al. (1972)	Stroke	No	1 mo.-10 years
Grynbaum et al. (1963)	Spinal cord injured	No	6½ years

evaluation of medical rehabilitation programs that use multiple measures of program success is not extensive. With the exception of the Smits (1974) work, none of the studies previously cited covers all the points. Two studies, those of Glick and Singer (1963) and Abramson (1968), however, are worth noting. Although not as extensive as the Smits work, they did look at multiple variables.

Glick and Singer surveyed 49 patients discharged during one calendar year from the rehabilitation unit of a large chronic disease hospital in New York City. The survey was done three to four years after discharge and consisted of an in-home interview using both open and closed questions. In addition, self-care skills were tested, and one close relative or friend was interviewed. The authors did not list broad categories of inquiry, but collected information on activity levels, income, employment, housing, medical services since discharge, rehabilitation services since discharge, community services since discharge, effect of family, social skills, and family composition. They found that, although some of the self-care skills were maintained, some were lost or had fallen below expected levels. Social activity was limited: much time was spent watching television or "sitting around." The family supplied significant financial support and the rest of the reported income came mainly from Social Security or the New York City Welfare Department. Medical

services were described as inadequate. Community services were reported as minimal. The authors concluded that a wide gap between home and outside performance was evident. Thus, social, medical, recreational, vocational, and community opportunities were limited.

In a study intended to determine what skills patients gain in the rehabilitation unit and how well they are maintained after discharge, Abramson (1968) followed 210 patients from admission to one year post discharge. He was also concerned with psychosocial function and tested the effect of a therapeutic community setting on the acquisition and maintenance of social skills. The patients were randomly assigned to either a traditional or a therapeutic community rehabilitation unit within the same hospital. The two units were physically identical 30-bed wards, and they had identical staffing. Abramson describes the traditional program as regimental with program usage largely dependent on the patient's individual personality, even though the particular therapy situation may attenuate the patient's strong and positive characteristics.

The therapeutic community program was based on the theory that states that psychosocial environment directly affects the treatment program, and that it attends to attitude change and patient staff interaction. In general, the therapeutic community concept is intended to foster

an atmosphere of involvement and independence (Racker, 1963).

The luck of the draw resulted in the control (traditional) group having significantly better physical status than the experimental (therapeutic community) group: 32 fully dependent in the control group and 38 fully dependent in the experimental group. At discharge, the control group had made significantly higher gains in self-care than the experimental group: 11 fully dependent in the control group and 22 fully dependent in the experimental group. However, by the time of the follow-up evaluations one year post discharge, the percentage of completely dependent control group patients had risen from 11% to 18% and the percentage of completely dependent experimental group patients had fallen from 22% to 6%. Despite the poorer physical status of the experimental group at admission, 11% of both groups were unable to live independently.

In psychosocial functioning, the experimental group scored substantially better at discharge than did the control group, in spite of the control group's better physical status. At the time of the one-year evaluation, the experimental patients scored well above control subjects with respect to overall social activity, overcoming the control group's preadmission advantage. In light of these results Abramson felt that the experimental group

had clearly tended to support the hypothesis "that the human environment of institutional care influences the long-term results of rehabilitation management" (1968, p. 65).

The Smits (1974) study is broad in scope and indeed does address the major considerations of program evaluation. For this reason, the Smits research is presented in detail.

He describes the results of his investigations at the Spain Rehabilitation Center in Birmingham, Alabama. He included the following categories of indicators: (1) the patient's physical, social, psychological, and vocational status; (2) the patient's satisfaction with the services received; (3) the cost-benefit ratio of services; and (4) the relationship of rehabilitation success or failure to medical and demographic characteristics. The follow-up study was conducted on all the patients who were treated at the center during 1968. Patients were contacted in 1971, three to four years after their discharge.

Of the original 260 patients, 65% (174) were living at the time of the follow-up study, 25% (64) were deceased, and 10% (26) were unavailable for follow-up. Of the 170 living, 83% (141) were willing and able to participate in the interview. The evaluation, which included both objective and subjective information, was carried out in the patients' homes. The subjective

information included both patient and interviewer responses which were mainly attitudinal in nature. A Likert-type scale was used to report the information. The family was also interviewed, and comments covering other topics were added by the interviewer.

Patients described the center as being most successful in giving them an independent attitude toward themselves. They described the center as being least successful in helping them to become fully employed. The study used "success scores" to rate each patient. These were a compilation of the former patient's rating of each of 10 items from "1" (which represented complete failure) to "5" (which represented complete success). These ratings were looked at individually and also were grouped and added to give an overall success score. The disability groups having the highest success scores were: pulmonary disease, spinal cord injury, and rheumatoid arthritis. The categories least helped included Parkinson's disease, post-traumatic brain syndrome, and cardiovascular accidents.

The significant characteristics of the successful group seemed to be associated with family response to the patient's condition, services received in the community, medical diagnosis, vocational status, and the patient's own perception of his or her limitations. In addition, age at onset of the disability appeared to make a difference.

In general, Smits concluded that the investment in time and money in the medical treatment of the patient should be accompanied by similar efforts to treat the family. The family must facilitate the rehabilitation process, allow the patient independence, and be cohesive and well adjusted in order for the patient to have the best chance at success in rehabilitation. It is also important that the community have services available to the patient after discharge from formal rehabilitation. "The patient may be treated in the hospital but he must eventually live in the community" (1974, p. 454).

Smits also points out the differences in the expectations for the younger versus the older disabled person. For the elderly, rehabilitation will be costly, employment after discharge rare, and mortality will be high. He suggests that rehabilitation goals may be different for various age groups.

Thus, this study underlines the importance of family education, direct treatment of psychosocial problems, and the involvement of the community in the rehabilitation process. Moreover, it is clear that more than one measure of rehabilitation success was taken to arrive at these conclusions.

When one considers the literature as a whole, it appears that there is a lack of specificity in the definition and measurement of basic terms such as: independence,

self-care, ambulation, severity of disability, etc. Therefore, it is exceedingly difficult to obtain valid baseline data or criterion values. The literature review has also provided clear evidence for the following assertions: (1) there has been no standardized evaluation criteria against which each rehabilitation program can be judged; (2) the problems in rehabilitation are not basic medical care, but in the long-term management regimes; (3) the family unit is instrumental in aiding the successful rehabilitation of the severely disabled patient.

CHAPTER III

DESIGN OF STUDY

Introduction

This chapter will present the research procedures used to determine the impact of a traditional and an experimental rehabilitation program on traditional measures of success, patient self-esteem, patients' perception of program usefulness, and hospital costs of spinal cord injured patients three or more years after their rehabilitation discharge date. This will include the following:

1. A description of the population and sample selection procedure;
2. A description of the experimental and control treatment programs;
3. A description of the instrumentation and the data collection procedures;
4. A description of the research design;
5. A description of the data analysis procedures.

Population and Sample Selection Procedures

The study population is the spinal cord injured patients who were admitted to the University of Michigan Parkview Rehabilitation Program during 1971-1973 (P) and

to the University of Michigan Hospital Rehabilitation Unit during 1973-1975 (H). Spinal cord injured patients are patients who have incurred a traumatic lesion of the spinal cord which has resulted in loss of neurologic function below the level of the lesion.

The experimental group sample for this study consists of patients who were treated in the Parkview program. The control group consists of patients who were treated at the University of Michigan Hospital Rehabilitation Unit at a time when the Parkview program was not available to them for rehabilitation services.

A list of all the in-patient admissions to the experimental and control rehabilitation programs was compiled. The experimental program list included patients admitted from July 1, 1971, to April 23, 1973, and the control program list included patients admitted from July 1, 1973, to June 30, 1975. Overlapping time periods were avoided to prevent possible cross contamination while the experimental program was operating. Consecutive years were chosen to achieve the closest possible match in number of years post discharge. All spinal cord injured patients were then selected from the admission lists. Those patients who had progressive disease or who were not admitted for a comprehensive rehabilitation program were eliminated. As a result, the experimental group had 23 members and the control group numbered 24. These patients

were then numbered chronologically by date admitted and, using a table of random numbers, 10 patients from each group were selected.

Treatment Programs

The Parkview Rehabilitation Project was a comprehensive, experimental, 26-bed rehabilitation unit developed to provide medical, psychological, social, educational, and vocational services to the severely physically disabled. The program was proposed in 1968 in response to a need expressed by the Michigan Vocational Rehabilitation Service for specific psycho-social-vocational services not available for their severely physically disabled clients. The University of Michigan Medical Center Department of Physical Medicine and Rehabilitation, which was already providing the medical services for these clients, offered to set up an integrated in-patient rehabilitation program that would be jointly sponsored by the university and vocational rehabilitation services. The appropriate contractual agreements were made and the project began in January 1969.

The program was developed around the concepts of the therapeutic community described by Kutner (1968). These concepts led to the development of two main objectives for the program: (1) "to develop and provide rehabilitation services which will be integrated and

uninterrupted from the time of onset of an individual's disability until his return to his community as a maximally functioning citizen"; and (2) to extend this kind of rehabilitation program to persons with more severe and multiple physical disabilities than are currently amenable to therapy (Becker, 1969). In order to meet the stated objectives, a series of procedures was set up, several of which were unique and innovative.

The first group of procedures involved the integration of medical and vocational services which were designed to be contemporaneous. For example, the admissions committee included medical and vocational rehabilitation personnel and together they evaluated the patient to determine if admission to Parkview was appropriate. To help insure a planned and prepared re-establishment of the patient in a working role in his community after discharge, the rehabilitation counselor from the patient's area of the state was included in this decision-making process.

When the patient was admitted to Parkview, the patient and his family were interviewed by the medical rehabilitation staff and the vocational rehabilitation staff. Goals were determined and agreed upon by the three groups and strategies were worked out for achieving them. The inclusion of vocational planning from the beginning was an attempt to prevent the lag time between medical rehabilitation and vocational rehabilitation, and the loss

of hope on the part of the patients that they would ever return to their homes and communities as productive members of society.

The second group of procedures was instituted to simulate as closely as possible conditions that the patient would experience in his own home and community after discharge. The staff conducted treatment sessions in ways that closely approximated the home or real life situation of the patient. These sessions included the usual activities of daily living (eating, dressing, bathing, toileting, etc.), plus those not usually pursued in a rehabilitation program (self-medication, child care, dining out, transacting business, using public transportation, grocery shopping, clothes shopping, sports outings, meal preparation, job interviewing, etc.). Staff and patients wore street clothes and meals were served in the dining room. Trips to the patient's home by the patient and staff helped give the staff a more accurate picture of the patient's home setting, work conditions, and personal life style. With this added input, the simulations were planned and carried out in a more realistic mode.

The Parkview project was housed in a small two-story motel-like building located a mile from the main university hospital grounds. Physical components of the building which allowed the patient to try non-hospital

living activities included a kitchen, an apartment, a small office, regular beds, home laundry facilities, bathrooms of various configurations, stairs, an elevator, and a car shell. The surrounding grounds offered curbs, a park, sidewalks, and a small shopping center. In addition there were the resources of a small city and the large university, and an assortment of work stations in the hospital and the community. These work stations or job sites were located where the patient could try work skills for short periods--one day to two weeks--to determine his ability to handle work responsibilities and environments. Prior to discharge, some patients lived in the apartment to test and/or improve their independent living skills. When the real living situation would include a spouse, children, an attendant, or parents, they were encouraged to join the patient in the apartment experience. These simulations and other related efforts were intended to introduce the patients to the demands of living outside the protective hospital environment, and thus to increase the chances for a successful transition from hospital to home.

A third group of procedures was aimed at providing integrated rehabilitation through interdisciplinary treatment. This was an attempt to insure coordinated and synchronous input by the staff and to avoid disjointed, contradictory services. To foster this approach, all the

members of a given team (social worker, occupational therapist, etc.) were housed in one office instead of being segregated by discipline. Team members felt that this arrangement facilitated communication and thus led to better integration of treatment programs.

The medical record was another system which was used to encourage interdisciplinary service. Weed's (1969) method of problem oriented record-keeping "facilitated interstaff communication through systematic and objective recording of patient care problems, management plans and progress notes" (Abrams, et al., 1973, p. 316). The record also served as a guide for the weekly team meetings at which each patient's progress toward achieving the stated goals was discussed. Patients and their families were invited to attend these meetings as they felt it necessary to discuss any changes in goals.

A fourth procedure was instituted to promote interaction between the Parkview program and other units of the university and the community. Staff members were encouraged to be accessible to all community, university, and governmental groups or individuals. There were interactions with many schools in the university (engineering, music, education, architecture); with many departments in the hospital (urology, family medicine, post-graduate medicine, orthopedic surgery); with various clubs, businesses, departments of city government, religious groups, and individuals in

the community; and with people from other universities, medical centers, and communities. The number of involvements and contributions from outside the immediate confines of the project was notable.

The fifth group of procedures was to provide simultaneous, interdisciplinary educational activities for medical and paramedical students. A wide variety of students had direct contact and interaction with the patients and the program. Students were included from disciplines of architecture, engineering, hospital administration, secondary education, elementary education, recreation, special education, psychology, rehabilitation counseling, occupational therapy, speech pathology, nursing, social work, physical therapy, medicine, and dietetics. Rotations at Parkview were set up so that students had interaction with disciplines other than their own. Emphasis was placed on gaining an appreciation of patient goals, interdisciplinary rehabilitation, and the post-discharge life of the disabled.

The sixth and last group of procedures was directed toward the inclusion and incorporation of the patient's local community resources, agencies, and individuals into the patient's rehabilitation program. The objective was to help insure local involvement when the patient returned home. The Parkview vocational rehabilitation counselors were in regular contact with the local

counselors to keep them informed of the patient's activities and to arrange for the counselors to visit Parkview whenever possible. Local counselors were also encouraged to take an active role in the decisions concerning the patient's vocational future. Local physicians, visiting nurses, therapists, and other appropriate individuals and agencies were contacted and asked for assistance in the continuing care of the patient. The Parkview staff was available for consultation to the local community.

The procedures just described were the methods by which rehabilitation services were made available to the patients. The following services were offered simultaneously according to patient or family needs:

1. Driver evaluations and training;
2. Pre-vocational explorations and work programs;
3. Remedial education;
4. Evaluation and treatment of communication disorders;
5. Evaluation and training in activities of daily living;
6. Evaluation and training of patient mobility;
7. Patient education and counseling with regard to changes in life patterns necessitated by disabilities;
8. Vocationally oriented counseling and assistance with job placement;
9. Continuing medical management and health care education;

10. Family and patient education in utilization of individual and/or community resources;

11. Follow-up on an out-patient or community basis.

The staff which provided the services included physical, occupational, speech, and hearing therapists, social workers, a secondary teacher, vocational counselors, pre-vocational evaluators, clinical psychologists, nurses, physicians, an audio-visual consultant, a driver education consultant, and other supportive service personnel.

The patients in the control group were treated in the adult rehabilitation unit of the University of Michigan Medical Center Hospital. This service, set up and administered by the department of physical medicine and rehabilitation, was opened in 1950. It was to provide physically disabled patients with in-patient medical rehabilitation services on a specialized basis. Referrals were received from other units of the university hospital (e.g. neurology, surgery) as well as from other hospitals. Admissions were arranged on an individual basis by the attending staff and resident physicians with the only criteria for admission being an apparent need for the services available.

The thirteen-bed ward was operated according to the traditional hospital medical service model. Thus, the physiatrist was responsible for the patient's primary

medical care, and, after the admitting work-up, would plan a rehabilitation program for the patient. This plan would include the necessary referrals for other medical, allied health, vocational counseling, and related services. These referrals would be answered by each appropriate discipline which assigned a staff person to treat the patient. The therapies were sometimes assigned to one or two persons in each service who would respond to all the referrals from the rehabilitation unit, but more often these duties were distributed randomly among many people. Patient treatment sessions were usually carried out in the physical therapy or occupational therapy areas although some sessions were in the ward or in other locations. Visits to the patient's home, and family and patient education sessions were carried out whenever the staff felt it was necessary.

The physical medicine department was equipped with various components which allowed the patient to try non-hospital living activities while still hospitalized. For example, there was a car shell, stairs, curbs, and several bathrooms in the physical therapy department, and a kitchen, bedroom, and office work area in the occupational therapy department. The rehabilitation ward itself had a sunporch where the patients who were able could eat together at a table rather than have a tray at their beds.

The medical record was of the standard type with each discipline recording its own progress notes on separate sheets. Weekly rehabilitation conferences were held at which selected patients' progress was discussed. Family conferences or other meetings were convened as necessary.

Students who worked with the rehabilitation patients included those in nursing, medicine, social work, physical therapy, occupational therapy, and speech pathology. The staff included those mentioned in the experimental program description.

In general, this program could be described as sequential, non-integrated, medically oriented, and hospital based.

Instrumentation

The conditions or scope of program evaluation was indicated earlier (p. 2). In particular, the contribution to the acquisition and maintenance of independent living skills by either the Parkview or the hospital program will be measured by a multi-purpose questionnaire. This questionnaire was developed by the author and was pilot-tested for clarity on a group of similar rehabilitation patients.

One part of the questionnaire determined each program's performance on traditional criteria of rehabilitation success. This was a modified version of the Smits

survey. Since one criterion for internal success of any rehabilitation program is the perceptions of its treated patients relative to their self-esteem, a further section of the questionnaire was directed towards obtaining this data. Since the Smits Scale addresses other criteria for internal success, the patients' perceptions of self-worth will be described by the Rosenberg Scale of Self-Esteem (Rosenberg, 1965).

The Smits Survey is a 91-item form which includes questions concerning physical, social, psychological, and demographic data. It also includes ten Likert-type items used to provide an outcome measure of rehabilitation success. It is these ten questions that are of interest for this study. In this group of questions, Smits includes one on the independent outlook of the subject as judged by the family. This question was not included in this study because the family will not be interviewed. Another question concerning affective outlook, also answered by the family in the Smits study, will be measured separately by the Rosenberg Self-Esteem Scale which will be described in the following paragraph. Thus the Modified Smits Scale used to provide an outcome measure of rehabilitation success consists of eight Likert-type items.

The Rosenberg Self-Esteem Scale was designed to measure attitudes toward the self along a favorable-to-unfavorable range. The ten items are of the Likert type.

Although originally designed for high school students, it has been tested for reliability and validity and the results were supportive (reproducibility - 92%, scalability - 72%, test-retest reliability - .85). In this study, this scale was substituted for a single item in the Smits scale. To measure the present affective outlook of each group, a modified version of the Rosenberg Scale will be used. The modification consists of changing the question from:

> "I am able to do things as well as most other people."

to:

> "I am able to do things as well as most other spinal cord injured people."

In addition, one question will be added and scored separately. This question reads:

> "I am able to do things as well as most other able-bodied people."

This modification will allow the patients to compare themselves to a group which functions physically at levels comparable to their own as well as to the able bodied. Thus, the Modified Rosenberg Scale used here to provide a measure of affective outlook consists of ten Likert-type items.

The Rehabilitation Services Usefulness Scale is a Likert-type scale designed by the author to produce data

which measure the patient's evaluation of the value of the rehabilitation program in enabling him or her to function productively after discharge. One goal of any rehabilitation programs is to return their patients to a productive and meaningful life. The Rehabilitation Services Usefulness Scale will be used in an attempt to get the patient's view of the program's contribution to the attainment of that goal. To obtain a broad measure of usefulness, the instrument includes questions concerning the accomplishment of patient goals, relativity of the program to non-hospital living, and overall satisfaction with the program. The fact that these patients will be able to lend a "hindsight perspective" given that they have been discharged from the program for a period of years will only serve to add importance to this measure.

Since all of those measures involve subjective responses on the part of the patients, an objective measure was included to confirm the patients' responses. Such a measure is adapted from the Donaldson ADL Evaluation Form (1973), and will be used to assess skills in physical functioning. This will be done by combining methods of chart audit, independent observation, and patient report. Subjects will be rated on 13 items, including eating, dressing, bathing, and transferring. The rating scheme is taken from the Donaldson Form where the scoring system ranges from "0" to "5" and "8"

depending on the amount of assistance or equipment necessary for the patient to accomplish the task. A higher score indicates dependent performance. In the original Donaldson Form a score of "8" indicates that the patient did not do the activity at all. For this study, it will be assumed that the patients could be assisted at the level of maximum assistance to perform any of the listed activities so the score of "8" will not be used. The Donaldson Form also scored each part of the observed activity separately. In the study here, however, this degree of refinement is not necessary. Therefore, the score obtained for the Modified Donaldson ADL Evaluation Form will be an indication of the patient's performance on the complete activity only.

All scales were pretested with a population from each program, close to, but outside of the defined time frame of the study.

All of these instruments were administered by personal interview to each of the patients in the study. The order of presentation was the Modified Smits Scale, the Rehabilitation Services Usefulness Scale, and the Modified Rosenberg Self-Esteem Scale.

Research Hypotheses

The research hypotheses for this study are concerned with three areas. The first area investigates

program success in the traditional sense. The second concern speaks to the self-esteem of the program participants. The third concept involves the patients' perception of the program's utility. The two programs are labelled the experimental or P-program and the traditional or H-program.

Specifically:

1. There will be a significant difference between spinal cord injured patients who are treated in the P-program and the spinal cord injured patients who are treated in the H-program as measured by their responses on the Modified Smits Scale.

2. There will be a significant difference between spinal cord injured patients who are treated in the P-program and the spinal cord injured patients who are treated in the H-program in their self-esteem as measured by their responses on the Modified Rosenberg Scale.

3. There will be a significant difference between spinal cord injured patients who are treated in the P-program and the spinal cord injured patients who are treated in the H-program in their perception of program usefulness as measured by their responses on the Rehabilitation Services Usefulness Scale.

These research hypotheses are represented statistically in the following manner:

For Research Hypothesis 1:

H_0: $\mu_P = \mu_H$

H_1: $\mu_P \neq \mu_H$ where μ_P = mean response of the P-group patients to the Modified Smits Scale and μ_H = mean response of the H-group to the Modified Smits Scale.

For Research Hypothesis 2:

H_0: $\mu_P = \mu_H$

H_1: $\mu_P \neq \mu_H$ where μ_P = mean response of the P-group patients to the Modified Rosenberg Scale and μ_H = mean response of the H-group patients to the Modified Rosenberg Scale.

For Research Hypothesis 3:

H_0: $\mu_P = \mu_H$

H_1: $\mu_P \neq \mu_H$ where μ_P = mean response of the P-group patients to the Rehabilitation Services Usefulness Scale and μ_H = mean response of the H-group patients to the Rehabilitation Services Usefulness Scale.

Design

The design for these hypotheses necessitates classifying each participant into mutually exclusive and jointly exhaustive categories based upon one characteristic, program identification. Because of the need for only one characteristic, the design will be a one-way classification scheme.

The following illustrates, by example, the development of the analysis for this study:

Let us consider a one-design variable called PROGRAM. This tableau can be illustrated in Figure 1.

FIGURE 1.--Initial Tableau for Design of Study.

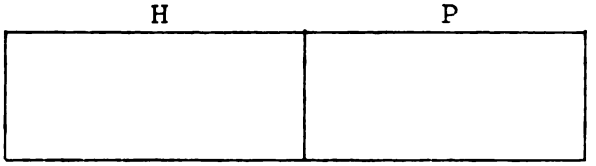
PROGRAM

Let us assume there are two such programs. Each program is considered to be a level of the variable PROGRAM. The programs can be called "P" and "H." This is illustrated in Figure 2.

FIGURE 2.--Secondary Tableau for Design of Study.

PROGRAM

H P



Further, assume that each participant in this study will respond to a questionnaire. The answers to these questionnaires will be summed to form a total score. The resultant score can be denoted by the letter "X."

Now, consider the case where there are several subjects in each program, although the number of subjects in each program need not be the same. It is necessary to be able to identify not only the program from which each respondent's score obtains, but also "who is who," within each program. This is accomplished through the use of subscripts--two for this study. The first subscript denotes the subject number within each program; the second subscript denotes the program to which the subject belongs. This latter subscript assigns a "1" to the H-program and a "2" to the P-program. For example:

X1,2: The score (X) for participant 1 in program P.

X6,1: The score (X) for participant 6 in program H.

X17,1: The score (X) for participant 17 in program H.

X2,2: The score (X) for participant 2 in program P.

If these scores were to be placed in Figure 2 above, the result would look like Figure 3.

FIGURE 3.--Tertiary Tableau for Design of Study.

H	P
$X_{6,1}$	$X_{1,2}$
$X_{10,1}$	$X_{2,2}$

The number of participants in each program is referred to as the frequency for each program and is denoted by the letter "n."

For this study the following names and frequencies to be used are shown in Table 4.

TABLE 4.--Name and Frequency for Each Program.

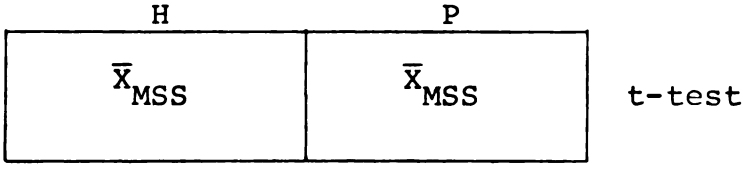
Group	Name	n
I	H	10
II	P	10

Since there are only two programs in this study a t-test can be used to detect if the patients have effectively the same scores on various instruments for this study. In other words, the t-test statistic will test the hypothesis that both programs have the same mean score. If, as a result of following this procedure, this hypothesis is proved false, one can then accept the proposition that the programs differ. One can then look at the observed mean scores and, depending on the scale properties of the instruments used, determine which program has a greater degree of success.

The terms "success" and "failure" are explicated as follows:

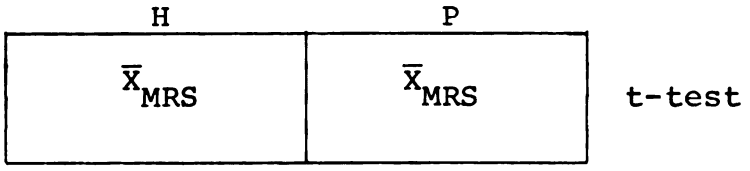
1. The value of the Modified Smits Scale (MSS) is formulated by patients responding to eight Likert-type scale items ranging from one to five (1 indicates success). These responses are then summed to form a total score. Smits suggests a "3" (three) be used as the demarcation between success and failure for each item. Consequently, a total score of 24 will be the level of success hoped for. With this stipulation the analysis can be illustrated in Figure 4. It is obvious that a low score is considered desirable. With this stipulation the analysis can be illustrated in Figure 4.

FIGURE 4.--Analysis of the Modified Smits Scale Data.



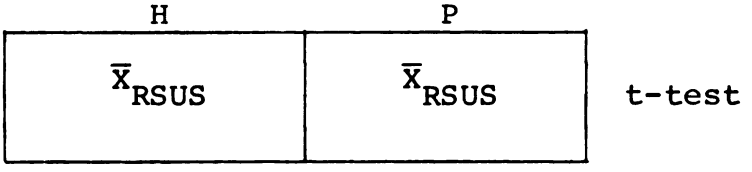
2. To assess program success relative to self-esteem the Modified Rosenberg Scale (MRS) will be used. Since the group structure is the same a similar analysis will be performed. The scale properties also suggest a low score to be desirable. This is shown in Figure 5.

FIGURE 5.--Analysis of the Modified Rosenberg Scale Data.



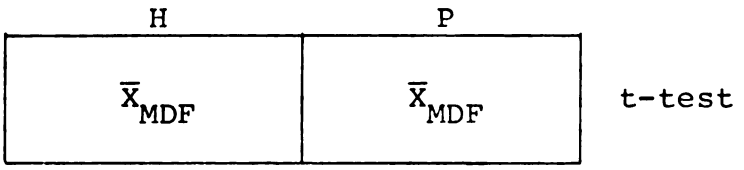
3. The design to compare the programs on the Rehabilitation Services Usefulness Scale (RSUS) is the same as the preceding tests. The scale properties of this instrument are also similar to the preceding instruments in as much as a lower score is to be preferred to a higher score. This is illustrated in Figure 6.

FIGURE 6.--Analysis of the Rehabilitation Services Usefulness Scale Data.



4. The objective measures to be used is the Modified Donaldson Form (MDF). The scale properties of this instrument indicate that a low score is better. This is shown in Figure 7.

FIGURE 7.--Analysis of the Modified Donaldson Form Data.



The logic for the analysis of the data of this dissertation can be summarized by the following steps:

1. Administer the questionnaire and record responses.
2. Form the scores for the various indices.
3. Classify each score into the appropriate program.
4. Test by a t-test statistic the hypotheses of no significant difference between the programs.
5. If the above hypothesis is rejected, determine the more successful program.

CHAPTER IV

RESULTS AND DISCUSSION

Introduction

The study used several assessment scores to evaluate the two rehabilitation programs. The instruments were: the Modified Smits Rehabilitation Success Scale, the Modified Rosenberg Self-Esteem Scale, the Rehabilitation Services Usefulness Scale, and an analysis of rehabilitation costs and length of stay. Because these instruments were self administered and the responses were subjective in nature, this study also incorporates an objective physical performance measure (Donaldson, 1973) coded by chart audit, patient report, and independent observation. The organization of this chapter is as follows:

1. The sample will be described in terms of selection procedures, demographic characteristics and clinical categories;
2. Statistical relationships between the items constituting each assessment instrument will be presented;
3. Summary statements about the sample as inferred from these statistics will be offered;
4. The hypothesis associated with the testing instrument will then be presented and discussed as follows:

a. The hypothesis under study;

b. The data required to render the hypothesis tenable;

c. The statistical tests and results involved in the hypothesis;

5. The physical performance score tabulations will be presented;

6. A contrast between the two groups relative to finances and length of stay will be discussed.

The chapter concludes with a summary of the findings of this study.

Demographic Characteristics of Clinical Categories

Sample Selection

The samples used in this study were drawn following the procedures described in Chapter III. The P-group required a drawing of 13 people before the final sample of 10 was obtained. Three non-respondents resulted because one respondent refused to participate and two could not be contacted via telephone or through inquiry of relatives. It was determined, however, that both these persons were living.

The hospital group required 18 people before the final sample of 10 could be secured. The total of eight non-respondents resulted because three were no longer living, one refused to participate, three had moved out of the state, and one was unable to be contacted. These data are summarized in Table 5.

TABLE 5.--Subject Selection from Subject Pool.

	H-group	P-group
Initial sampling frame	24	23
Number contacted	18	13
Non-respondents	8	3
Final sample size	10	10

It is distressing to note that the three deaths in the H-group were all by suicide. The P-group, which has been discharged over two years longer than the H-group, had no suicides in its sample. This unexpected difference in the mortality rate and reasons for the mortality could reflect the P-program emphasis on patient goal-setting and practice on independent living skills. The program was designed to assist the patient in examination of the demands and exigencies of the life the patient wished to lead after discharge. It provided the opportunity to experiment with the activities essential to a particular life situation while still in the supportive rehabilitation atmosphere of the program. Initial confrontations with life obstacles thus occurred in a situation where assistance, support, and advice were available. It is reasonable to assume that this reduced the number of confrontations that occurred when the patient returned home where adequate assistance, support, and advice are not

always available, and buffered the effects of those that did take place. This planning suggests that the P-group would be better equipped to handle the transition from hospital to home both by having some experience with the difficult situations that arise outside the hospital and by having fewer new and stressful situations to handle at that time. This program assisted the P-group in adjusting to life outside the hospital and helped avoid severe depression and feelings of helplessness, thus allowing the patients to use their skills to adjust to life.

One might contend that, because the P-group had been out of the program two years longer than the H-group, the P-program sample did not contain the names of those in their group who had died. However, obtaining the sample lists from the admissions roster assured that all patients who were admitted during the specified time period were included (see Chapter III, p. 31), and mortalities were not deleted from the P-group sampling frame.

It might also be speculated that the three deaths in the H-group represented subjects who might be substantially different from the others of their group; however, such was not the case. Upon inspection of their records, it was clear that the fatalities fell well within the age, level of injury, and length of stay ranges of their group. Demographically, they demonstrated no unusual characteristics.

Therefore, one could conclude that, as measured by mortality rate alone, the P-program group was better able to cope with and overcome some of the more crucial problems and difficulties of disability that arise after discharge from the hospital. Consequently, the patients did not exhibit the same tendencies toward suicide.

Age Characteristics

The basic demographics also provided birth data, and the resulting age characteristics of the two groups are worthy of comment. At the time of injury, the P-group was an average of 27.4 years old, while the H-group averaged 24.6 years--almost three years younger. Furthermore, the P-group was admitted to the program about 1.5 years after injury, and the H-group .5 years after injury. These differences resulted in the P-group patients being almost four years older on admission to the program than the H-group patients. These figures are noted in Table 6 below.

TABLE 6.--Age at Injury and Admission.

Average Age	H-group	P-group
At time of injury	24.6 years	27.4 years
At time of admission	25.1 years	29.0 years

There were more patients in the 41-50 year old bracket in the P-group and fewer in the 18-20 year old bracket than in the H-group. These figures are shown in Table 7.

TABLE 7.--Distribution of Ages at Admission.

Age Range	H-group	P-group
18-20 years	6	3
21-30 years	2	4
31-40 years	1	0
41-50 years	1	3

Interpretation of these data requires consideration of the following:

1. Younger patients (under 40) have more flexibility, strength, and stamina to perform the activities required to function independently as disabled persons.

2. Younger patients are better able to adapt to the changes brought on by disability than older patients.

3. As the time from the occurrence of the injury increases, so the chance increases that complications, i.e., decubitus ulcers, urological problems, etc., will occur.

4. As the time from the occurrence of the injury increases, so also does the chance increase that the

patients will develop harmful attitudes of resignation toward the effect on their lives of their injury.

Therefore, in the arena of physical functioning, the older P-group would not be expected to attain the level of skill and independence gained by the younger H-group, and, since we are dealing with small samples, we would expect the mean performance scores to be poorer for this older group. This would deflate the magnitude of improvement and consequently tend to obscure any program differences that occurred in favor of the P-program. The effect would influence the score particularly at follow-up because the P-group is now six years older, and the three subjects over 40 at onset of injury now average 50 years of age.

Present Living Arrangements

Another characteristic worth exploring is present living arrangements (Tables 8 and 9). The P-group tends to be living with a spouse (P-group = 6, H-group = 3), while the H-group tends to be living with their parents (H-group = 6, P-group = 2). This could be due in part to the previously noted younger age at injury of the H-group. Since the H-group was younger at injury, more of the H-group than the P-group presumably would be living at home at the time of injury, and thus would return there

TABLE 8.--Present Living Arrangements and Average Age at Injury.

Living Arrangements	H-group	Average Age at Injury	P-group	Average Age at Injury
Alone	1	24.1 years	2	24.0 years
With spouse - partner	3	28.8 years	6	32.5 years
With parents - family	6	22.6 years	2	19.5 years

TABLE 9.--Present Living Arrangements and Present Average Age.

Living Arrangements	H-group	Average Age at Present	P-group	Average Age at Present
Alone	1	26.5 years	2	27.6 years
With spouse - partner	3	33.4 years	6	39.0 years
With parents - family	6	26.7 years	2	26.1 years

after discharge. However, the data presented in Tables 8 and 9 dispute this premise. The average age at injury of the H-group now living with parents (Table 8) was older by 3.1 years than that of the P-group now living with parents. The average present age of both groups who live with their parents (Table 9) is about the same. That is, the H-group presently living with their parents was not younger at injury and is not younger now. Consequently, the larger number of H-group members living with their parents is not explained by age at injury or age at present either.

Because the H-group has more patients living with their parents now (6 versus 2) one might expect that, regardless of age, the H-group had a larger number of their patients living with their parents at the time of injury. Table 10 shows that, in fact, the groups were quite similar in terms of their place of residence at the time of injury (4 versus 3). That is, the H-group did not have a significantly greater number of its members living at home as expected. The larger number of H-group patients presently living with parents does not seem therefore to be explained by residence at the time of injury.

TABLE 10.--Living Arrangements at Time of Injury.

Living Arrangements	H-group	P-group
Alone	2	3
With spouse - partner	4	4
With parents - family	4	3

The living-with-spouse category was analyzed therefore to see if there is any logical explanation for the larger number of P-members in that category. The P-group, as found earlier, is somewhat older than the H-group, and Tables 8 and 9 show the P-group in the spouse category to be older both at time of injury and at present. This pattern is to be expected as in the general population where the percentage of the married population increases as age increases. This provides a partial explanation for the greater number of P-group members being in the spouse category.

Since the P-group as a whole was older at the time of injury, we also would expect to see a greater number from the P-group in the spouse category at that time. However, Table 10 fails to confirm this. Therefore, although there is some explanation for the differences between the groups in the spouse category, there is none for the differences in the living-with-parents category.

Because the differences do exist in present living arrangements, and staisfactory explanations for those differences have not been found in the age data, other possible sources of explanation must be considered, particularly the impact of the rehabilitation programs. The emphasis of the P-program on psycho-social skills and community experiences may have had some effect in encouraging independent living situations. It provided the opportunity for practice, experimentation, and feed-back in social situations, as well as in physical skills. This could have encouraged the P-group to engage in such activities, and also could have given those members greater occasion to meet potential partners. The data collection was not sensitive enough to confirm this explanation, but the fact does remain that, while only 20% of the P-group continues to live with parents or family, 60% of the H-group is in that situation.

It is important to state that entrance into independent living situations away from family, including marriage, is a reasonable expectation for spinal cord injured patients. Indeed, in this study population, there were five new partnerships formed following injury--three in the P-group and two in the H-group. Four partnerships were dissolved after injury, three in the H-group and one in the P-group. This does not represent a substantially greater number than might be found in the general

population. The result of these changes in living situation would seem to indicate that the P-group is somewhat less dependent on parents and more oriented toward independent living than the H-group.

It is rather encouraging to note that no one in either group is institutionalized at present. This could be a concern at some time in the future for those presently living with parents, especially if the parents are elderly. We would expect that if the parents die or become disabled, the disabled son or daughter would probably require institutional care. This concern may be present as well for those living with a spouse. However, the likelihood of the disabled child surviving the parent is much greater than the likelihood of the disabled spouse surviving the able-bodied spouse.

Sex Ratio

The sex ratio of the two groups is similar (Table 11). The predominance of males in the spinal cord injured population is a consistent finding in other studies as well.

Level of Injury

An analysis of the two groups according to level of lesion showed the H-group with seven quadriplegics and three paraplegics, and the P-group with five quadriplegics and five paraplegics. Although the H-group had two more

TABLE 11.--Sex Distribution.

Sex	H-group	P-group
Females	4	3
Males	6	7
Total	10	10

quadriplegics, both were C_8 spared and thus were similar to high paraplegics in terms of the relatively gross functional performance measured in this study. Therefore, the groups can be considered equivalent in neurologic function level. These figures are displayed in Table 12.

TABLE 12.--Level of Injury.

Level	H-group	P-group
C_6 quadriplegia	4	4
C_7 quadriplegia	1	1
C_8 quadriplegia	2	0
T_4 - T_{12} paraplegia	3	5
Total	10	10

Educational Level

Educationally, the groups are very similar. It is perhaps surprising that there are no subjects with college degress, even though the present average age is almost 32 years. It should be noted that 70% of the H-group and 80% of the P-group are high school graduates or better, and that two members of each group are now in college. Table 13 demonstrates the similarities of the two groups' present educational level.

TABLE 13.--Level of Education at Present.

Educational Level	H-group	G-group
Partial college	3	3
High school graduate	4	5
Some high school	3	1
Junior high school	0	1

In summary, since the samples were randomly drawn, they can be assumed statistically equivalent. The previous data have confirmed that, aside from present living arrangements and age differences, the group members are indeed similar.

Assessment Instruments

Modified Smits Rehabilitation Success Scale

The instrument used to measure the traditional rehabilitation success for each rehabilitation program was modified from the Smits work (previously described in Chapter II, p. 26). The Smits Rehabilitation Success Scale consisted (in part) of ten Likert-type questions which the patient answered by selecting one of the five scaled alternatives for each question (see Appendix A, p. 117). The questions covered a wide range of rehabilitation objectives including work status, understanding of injury, level of social activities, feelings about being

handicapped, and participation in decision-making. These questions thus covered physical, social, psychological, and vocational parameters of rehabilitation.

Smits' original instrument contained two questions which were deleted for this study because they addressed the families' views of the patients' feelings concerning desire for independence and affective outlook. These items were not included because the family was not interviewed. However, affective outlook was measured separately in this study by the Rosenberg Self-Esteem Scale which will be described in the next section of this chapter. The Modified Smits Scale, therefore, consisted of eight Likert-type items, each with five scaled alternatives. Each item was scaled from '1' to '5' with "1" being complete success and "5" being complete failure. A score of '24' or less, obtained by summing across items, is considered successful.

Table 14 displays the mean, standard deviation, and range for each group on the Modified Smits Scale. No clear pattern emerges from inspection of the data. It must be noted, however, that the range of choices in the H-group are more restricted than in the P-group, and, as a rule, the instances where the ranges are restricted are towards the lower or more desirable end. However, neither program appears to be superior as measured by the Modified Smits Scale.

TABLE 14.--Modified Smits Rehabilitation Success Scale Means, Standard Deviations, and Ranges.

Items	H-group			P-group		
	$\bar{X}$	SD	Range	$\bar{X}$	SD	Range
1. Employment	4.6	1.30	1-5	4.2	1.70	1-5
2. Physical skills	1.3	.48	1-2	2.0	1.41	1-5
3. Self-care	2.6	1.20	1-4	2.2	1.23	1-5
4. Activity outside home	1.4	.70	1-3	1.8	1.23	1-5
5. Self-consciousness	1.7	1.16	1-4	2.1	1.10	1-4
6. Knowledge about injury	1.5	.53	1-2	1.6	.70	1-3
7. Social relationships	2.4	.84	1-4	2.8	.92	1-4
8. Decision-making	1.8	.79	1-3	1.3	.68	1-3

Table 15 shows the intercorrelations between items on the Modified Smits Scale. The correlation pattern is also mixed. There are instances of high and low item correlations. This mixed correlational pattern might suggest that there may be more than one dimension or facet that the Modified Smits Scale is assessing. It can be observed, however, that the correlational pattern for this study is quite similar to the correlational pattern that Smits found in his study (Appendix E, p. 129). This suggests a comparable pattern of responses between this study sample and Smits' study. Thus, the items will be summed across and a total score will be obtained. This total score will be the dependent variable for the first hypothesis to be tested. Thus, we are comparing programs on the Modified Smits Scale. This is represented statistically as:

H_0: $\mu_P = \mu_H$

H_1: $\mu_P \neq \mu_H$ where: μ_P = mean response of the P-group patients to the Modified Smits Scale and μ_H = mean response of the H-group patients to the Modified Smits Scale.

A t-test was used to test the hypothesis. Results are shown in Table 16.

TABLE 15.--Modified Smits Rehabilitation Success Scale Correlations.

Items	1	2	3	4	5	6	7	8
1. Employment	1.00							
2. Physical skills	.26	1.00						
3. Self-care	.51	.35	1.00					
4. Activity outside	.26	.73	.50	1.00				
5. Self-consciousness	.35	.31	.07	.11	1.00			
6. Knowledge - injury	-.08	.31	.11	.47	.08	1.00		
7. Social relations	.46	.45	.46	.59	.17	.24	1.00	
8. Decision-making	.31	-.20	.33	-.25	.06	-.01	.27	1.00

TABLE 16.--Comparison of H-group and P-group on the Modified Smits Scale.

Group	n	$\bar{X}$	t-value	df	Sig
H	10	17.30	-.31	18	n.s.
P	10	18.00			

The t-value is not significant. This is not surprising given our earlier inspection of the data. We are forced to conclude at this point that the programs do not differ relative to the success scores as defined by the Modified Smits Rehabilitation Success Scale.

The unexpected result of nonsignificance might be explained by the relatively higher scores of the P-group on several items. For example, Table 14 shows the P-group did not see themselves improving in physical function for the time from admission to the present as much as the H-group. This could be due to the older age and later admission of the P-group. As mentioned previously, the older patients would not be expected to make the large gains scored by the younger patients, and with such a small "n," the mean would be severely affected by this older group. The P-group was also admitted later after injury, with higher initial functional abilities and therefore would likely have fewer skills left to be gained. When combined, these factors could have elevated

(made less successful) the P-group score on that particular Smits item.

The other two items that were surprisingly high for the P-group were social in nature--activities outside the home and social relationships (Table 14). As previously discussed in the demographic section, age may play a role here. The older group would tend to be less active and have less stamina for outside activities. It must also be remembered that, at the time the patients responded to the Modified Smits Scale, the P-group included three members who averaged 50 years old. Thus, we would expect the P-group to demonstrate some decline in their physical and social activities because of the greater difficulty they experience in mobility as they get older. In spite of this, the P-group did score as well as the H-group on the Modified Smits Scale.

Thus, as traditionally defined by the parameters of employment, physical functioning, self-care, social activities, awareness of disability, understanding of injury, and decision-making, both groups can be termed successful. Both were well above the Smits standard of success ($\bar{X} = 24.00$). One can conclude that the programs perform equally well when using a modified version of a traditional index of rehabilitation program success.

Modified Rosenberg Self-Esteem Scale

To measure the present affective outlook of each group, a Modified Rosenberg Self-Esteem Scale was used (Appendix B, p. 120). The Rosenberg Scale is a 10-item summated rating scale in which the subjects choose from four alternatives (agree strongly, agree, disagree, disagree strongly) to evaluate their self-worth. This scale was substituted for a single item in the Smits Scale which asked the family to assess the patient's affective outlook.

The modification of the scale consisted of changing the statement:

> "I am able to do things as well as most other people."

to:

> "I am able to do things as well as most other spinal cord injured people."

This allowed subjects to compare themselves to a group which functioned physically at levels comparable to their own. In addition, the following question was added and scored separately:

> "I am able to do things as well as most other able-bodied people."

This allowed the disabled groups to compare themselves to the able-bodied and gave the opportunity to see if differences did exist between responses to the two questions.

In other words, do the spinal cord injured patients judge themselves in the same way when the comparison is with other spinal cord injured patients as they do when the comparison is with the able-bodied population.

The scale was scored according to Rosenberg's formula which produced a total score that has a possible range of 0 to 7 with "0" being very high self-esteem and "7" being very low self-esteem. The ranges, means, and standard deviations for the total scale score of each group are shown in Table 17.

TABLE 17.--Modified Rosenberg Self-Esteem Scale Means, Standard Deviations, and Ranges.

Group	$\bar{X}$	SD	Range
H	1.67	1.12	0 - 4
P	1.89	.78	0 - 3

It is apparent from these data that the groups did not differ substantially on this scale. The P-group had a narrower range and smaller standard deviation, so they tended to agree more on their ratings of the items.

These data lead to the second hypothesis to be tested. It addresses the patients' self-esteem as measured by the Modified Rosenberg Self-Esteem Scale and is represented statistically as:

H_0: $\mu_P = \mu_H$

H_1: $\mu_P \neq \mu_H$ where μ_P = mean response of the P-group patients to the Modified Rosenberg Self-Esteem Scale and μ_H = mean response of the H-group patients to the Modified Rosenberg Self-Esteem Scale.

A t-test was used to test the hypothesis. Results are shown in Table 18.

TABLE 18.--Comparison of H-group and P-group on the Modified Rosenberg Self-Esteem Scale.

Group	n	$\bar{X}$	SD	t-value	df	Sig
H	10	1.67	1.12	-.49	16	n.s.
P	10	1.89	.78			

The t-test value is not significant. There appears to be no difference between these two programs relative to the Modified Rosenberg Scale. Thus, the P-program does not enhance patient self-esteem to a greater degree than the H-program. However, the mean scores do fall well within the 0 to 2 range of high self-esteem as defined by Rosenberg. Thus, we can conclude that the programs do not differ in their effect on patient's self-esteem, and both groups have patients who see themselves in a very positive manner.

The questions comparing the patients' abilities with those of the able-bodied, and with other spinal cord injured persons, were analyzed separately. These were scored on a simple 1 to 4 scale with "1" indicating strong agreement, and "4" indicating strong disagreement. The means of these scores are shown in Table 19.

TABLE 19.--Mean Scores: Perception of Ability to Function as Compared with Able-Bodied and Spinal Cord Injured Persons.

Ability to function	H-group		P-group	
	$\bar{X}$	Range	$\bar{X}$	Range
Compared with able-bodied	2.65	1-4	2.50	1-4
Compared with spinal cord injured	1.60	1-3	1.70	1-4

The H- and P-groups do not differ from each other in their respective judgments of their ability to perform as compared to able-bodied groups and to spinal cord injured groups. However, although they both agree that they can perform as well as other spinal cord injured persons, they rank between "agree" and "disagree" when comparing their abilities to those of the able-bodied group. In other words, the two groups felt functionally equal to other spinal cord injured persons, but somewhat less equal to the able-bodied population. This latter finding is, of course, not surprising.

In pursuing the data further, it is noted that there were two patients, one in each group, who strongly agreed that they could do things as well as most other able-bodied individuals. This leads one to speculate whether or not the reality of the disability has been fully translated into personal terms. It is important to clarify the difference between an attitude and an actual performance. It is hoped that the disabled person would perceive eventually that there are some physical things that they never will be able to perform comparably to the able-bodied population; but, that personal relationships and other meaningful and satisfying experiences, the attributes and activities of an ultimately meaningful life, can certainly compare favorably with, or possibly exceed, those of the able-bodied population.

Rehabilitation Services Usefulness Scale

The Rehabilitation Services Usefulness Scale is a 10-item Likert-type scale designed to measure the patients' opinions of the rehabilitation program's ability to help them prepare for life away from the hospital. Questions referred to accomplishment of patient goals, staff concern with patient's goals, opportunities for decision-making, understanding of injury, overall satisfaction with the program, and preparation for functioning after discharge (Appendix A, p. 117).

As indicated by Table 20 (lower score is desirable), P-patients tended to score lower than the H-patients on each item. It is even more interesting to observe the smaller deviations in the P-group. One can infer that the P-group patients were more in agreement with one another on their ratings of the usefulness items. This is further emphasized by noting the range of scores on the items. The P-group tended to select within a much narrower band than did the hospital group. This is shown dramatically in question 9:

"Do you feel the staff worked on your goals?" The choices of the P-group were either "always" or "almost always." This finding is particularly encouraging because one of the fundamental notions of the P-program was to encourage patient goal-setting.

Table 21 presents the correlations between the items on the Rehabilitation Services Usefulness Scale. The items tend to show strong relation to one another. That is, the high inter-item correlations suggest that it is only the concept of "usefulness" that is being assessed. In other words, those who tend to answer a particular way on one question of this scale tend to answer the same way on the other items of the scale. This suggests that a total score or a sum across items is appropriate.

It can be expected that the P-group patients would see their program as more useful to themselves than would

TABLE 20.--Rehabilitation Services Usefulness Scale Means, Standard Deviations, and Ranges.

Items	H-group			P-group		
	$\bar{X}$	SD	Range	$\bar{X}$	SD	Range
1. Goals accomplished	2.7	1.06	2-5	2.3	.95	1-4
2. Made decisions	3.5	1.27	1-5	1.8	.63	1-3
3. Useful skills	2.7	1.16	1-5	2.0	1.05	1-4
4. Staff Concern	2.3	.95	1-4	1.8	.63	1-3
5. Staff together	2.3	1.06	1-4	2.2	.63	1-3
6. Prepare for home	2.9	1.37	1-5	1.9	.74	1-3
7. Understand injury	1.8	1.03	1-4	1.6	.52	1-2
8. Worked together	2.4	1.08	1-4	1.7	.57	1-3
9. Patient goals	2.4	.84	1-4	1.8	.48	1-2
10. Satisfactory service	2.3	.95	1-4	1.9	.63	1-3

Note: For complete items, see Appendix A, p. 117.

TABLE 21.--Rehabilitation Services Usefulness Scale Correlations.

Items	1	2	3	4	5	6	7	8	9	10
1. Achieve	1.00									
2. Decide	.30	1.00								
3. Skills	.39	.30	1.00							
4. Concern	.29	.36	.54	1.00						
5. Unison	.53	.18	.40	.66	1.00					
6. Prepare	.44	.26	.75	.68	.68	1.00				
7. Insight	.51	.13	.66	.30	.37	.60	1.00			
8. Joint	.39	.28	.58	.79	.73	.85	.58	1.00		
9. Goals	.52	.60	.59	.67	.47	.68	.62	.78	1.00	
10. Satisfy	.48	.36	.71	.77	.58	.78	.57	.86	.75	1.00

Note: For complete items, see Appendix A, p. 117.

the H-group patients since the P-group patients were encouraged to set their own goals and use the program resources to accomplish them. The data suggest that indeed this did occur.

The third hypothesis to be tested, then, concerns the patients' view of the program's value in preparing for return to home and community. This is represented statistically as:

H_0: $\mu_P = \mu_H$

H_1: $\mu_P \neq \mu_H$ where μ_P = mean response of the P-group patients to the Rehabilitation Services Usefulness Scale and μ_H = mean response of the H-group patients to the Rehabilitation Services Usefulness Scale.

A t-test was used to test the hypothesis, and the results appear in Table 22.

TABLE 22.--Comparison of P-group and H-group on Rehabilitation Services Usefulness Scale.

Group	n	$\bar{X}$	SD	t-value	df	Sig
H	10	25.30	8.41	2.09	18	.05
P	10	19.00	4.47			

The t-test value is significant. Consequently, there is a difference between the programs in their perceived ability to assist the patient in obtaining the necessary skills to function in the community after discharge. This suggests that the P-group sees their program as better able to teach them how to live away from the hospital.

This statistical test has confirmed what has been suggested by inspecting the means and standard deviations. It is repeated, for emphasis, that the P-group's success on this scale is evidence for the achievement of the stated goal of the program (i.e. adjustment to living as a disabled person in the community).

Modified Donaldson ADL Evaluation Form

As an objective check on the patients' heretofore subjective data, a measure of physical functioning was included in the study. The measure utilized chart audits, independent observations, and patient reports to detail performance scores at admission, discharge, and follow-up. Subjects were rated on 13 items, including eating, dressing, bathing, and transferring. Ratings ranged from '0' for not observed to '5' for assistance that required lifting and '8' for non-performance. This rating scheme, with its definitions of each score, was taken from the Donaldson

ADL Evaluation Form. The Form was modified slightly by using a 0 - 5 score for a complete activity, rather than for each part of the activity, and by deleting the score of '8' because it was assumed that the subject could be assisted at the level of '5' (maximum assistance) to perform any of the listed activities (Appendix A, p. 117). Modifications were detailed in Chapter III (p. 44).

The data in Table 23 indicate that the P-group entered with a higher level of physical skill than the H-group, made gains during admission, and suffered a slight remission after discharge. The H-group made gains during admission and had a slight gain in skill after discharge. The data in Table 24 indicate that the P-group made significantly greater gains during their program than did the H-group and made a larger total gain from admission to the present.

The greater gain during the program by the P-group may be a reflection of the P-program's expectation that all patients attempt independent living. That is, the P-program expected its patients to practice more independent activity while at the rehabilitation facility, and that may have resulted in the higher gains of performance they scored from admission to discharge. That same expectation may also have been one reason for the P-group's slight loss of skill at follow-up five years later. The P-group members may have reached their maximum independent

TABLE 23.--Modified Donaldson Form Means, Standard Deviations, and t-test Statistic for Comparison of the H-group and P-group at Admission, Discharge, and Follow-up.

Time	Group	$\bar{X}$	S.D.	t-value	Significance
Admission	H	49.10	17.75	1.33	n.s.
	P	39.80	13.07		
Discharge	H	40.70	16.17	2.71	.01
	P	24.60	9.50		
Follow-up	H	38.70	16.95	1.69	n.s.
	P	27.60	12.05		

TABLE 24.--Modified Donaldson Form Means, Standard Deviations, and t-test Statistic for Comparison of the H-group and P-group at Three Different Time Periods.

Time	Group	$\bar{X}$	S.D.	t-value	Significance
Admission to follow-up	H	-10.40	16.11	.32	n.s.
	P	-12.20	8.12		
Discharge to follow-up	H	- 2.00	12.83	-1.00	n.s.
	P	3.00	8.92		
Admission to discharge	H	- 8.40	7.07	2.03	.05
	P	-15.20	7.91		

performance at that time and are now functioning at their maximum practical level of independence. They have learned which activities are worth their time and energy and which are not. Another explanation for the slight loss of function in the P-group is the decreased ability of older individuals generally to maintain a maximum level of function. Because the P-group has three members who now average 50 years of age, a decrease in skill level is not an unexpected finding.

Tables 23 and 24 show that the members of the P-group seem to be more alike in their performance than those of the H-group. The standard deviations show that the members of the H-group vary quite widely in their performance scores. This indicates that some members of this group were very dependent and others very independent. This is the case at all three rating periods. For the P-group, there is always less variance between the subjects, and they show an even greater degree of similarity at discharge. This may suggest that the P-program tended to expect a more specific independent performance level.

These data are in some conflict with the Modified Smits Scale data. Here the P-group clearly performs at a higher level of independence than the H-group (Table 23). Yet, on the Modified Smits Scale, the P-group rated themselves lower than did the H-group. This may have occurred because, on the Modified Smits, the patients were asked to

compare their physical functioning at admission to their physical functioning now. The P-group, which attained a significantly better performance rating from admission to discharge, but lost some skill post discharge, may have scored themselves too severely. The H-group members, who gained skill but at a less proficient level than the P-group, and gained slightly more skill after discharge, may have over-rated themselves. Therefore, the Modified Smits Scale reflected the H-group as better on physical functioning, but the Donaldson scores indicate that the P-group made better gains from admission to discharge, and from admission to the present than the H-group. Added to this, the P-group made significantly better gains from admission to discharge ($T_1 - T_2$) in 1.7 months compared to the H-group's 4.2 months, i.e. the P-group made greater gains in less time (Table 25). Further, the P-group continues to have a lower (better) performance score at present even though they have been discharged two years longer than the H-group.

TABLE 25.--Average Months in Various Time Segments for the P-group and the H-group.

Group	Admission to present	Admission to discharge	Discharge to present
H	40.0 mos.	4.2 mos.	35.8 mos.
P	63.5 mos.	1.7 mos.	61.8 mos.

Financial Data

The dependent variables for this portion of the analysis will be length of stay, readmissions, and cost. In examining the length of stay data, it should be pointed out that there are several different time periods to consider in both programs. These include: (1) the period of hospitalization prior to admission (all subjects had previous hospitalizations), (2) the actual time spent in the programs (the study programs), and (3) the total time spent both in previous hospitalizations and in the study programs. These figures are presented in Table 26.

The table shows that the P-group had substantially more days in the hospital before being admitted to their program than did the H-group. This agrees with the earlier finding that the P-group was admitted to their program 1.5 years after injury, and the H-group was admitted to their program .5 years after injury.

The range and standard deviation of the previous hospitalization days of the P-group are large. This is explained by the presence of one P-group patient who amassed 600 previous hospitalization days. When this patient is excluded, data on the remaining nine P-group patients (P_1) show a more consistent pattern, with the P-group being similar to the H-group, and the average number of previous hospitalization days being considerably reduced. However, the P-group still has more previous

TABLE 26.--Ranges, Standard Deviations, and Average Number of Days Spent in Previous Hospitalizations, in the Study Programs, and in All Hospitalizations--from Injury to Study Program Discharge.

Group	n	Previous Hospitalization Days	Range	S.D.	Study Program Days	Range	S.D.	Total Hospitalization Days
H	10	122	46-270	68.78	119	44-193	48.90	241
P	10	221	87-600	135.89	50	18-153	38.82	271
P_1	9	179	87-255	52.76	39	18-87	19.11	208

hospitalization days than the H-group. (The H-group did not contain any subjects who were as deviant from the rest of the group members.)

Table 26 also indicates that the P-group had substantially fewer days in their rehabilitation program (P-group = 50 days, H-group = 119 days). It was postulated that the greater number of previous admission days would explain the lower number of rehabilitation program days for the P-group. If so, this difference should disappear when comparisons are made between the P-group and the H-group patients who were admitted with a similar number of previous hospitalization days. Therefore, the H-group members who had as many previous admission days as did the P-group should have fewer days in the H-program than the remaining H-group patients. However, when the five H-group members (H_1) with a higher number of previous hospitalization days (180 days - similar to the P_1-group) are studied, the average number of days spent in the H-program does not go down (Table 27). Thus, having more previous hospitalization days did not reduce the number of days necessary for the H-group to gain independence in their program.

On the other hand, the P-group members who had as few previous admission days as did the H-group should necessitate a longer stay in the study program than the other P-group members. However, if the three P-group

TABLE 27.--Average Number of Days Spent in Previous Hospitalizations and in the Study Programs by Selected Subjects in the P-group and the H-group.

Group	n	Previous Hospitalization Days	Study Program Days
H	10	122	119
P_2	3	121	30
H_1	5	180	121
P_1	9	179	39

members (P_2) who average fewer previous hospitalization days (121 days - similar to the H-group) are studied, the number of days spent in the P-program does not go up (Table 27). In the situations where there were fewer previous hospitalization days the number of days necessary for the P-group to gain independence did not increase. Therefore, more previous hospitalization days were not an advantage to the P-group. This suggests that had patients been admitted to the P-program sooner they would have been able to complete the program in the same amount of time (i.e. 50 days - Table 26).

When previous hospitalization days and study program days are totaled for both groups, the P-group averaged only 30 days more than did the H-group (Table 26). As reported in the previous section of this study, the P-group scored significantly higher performance gains during the 50 days they spent in the P-program than did the H-group in their 119 days in the H-program. Thus, the P-group became much more independent with only a slightly (12.5%) longer total period of hospitalization. Furthermore, if the divergent data of the one P-group member are removed from the P-group totals, the remaining P_1-group averages a total hospitalization time of 208 days, 33 days fewer than the H-group. The greater levels of independence in the P-group, therefore, were achieved

with little, if any, increase in the total hospitalization time.

These data have important implications in cost considerations. It was not possible to gather actual dollar costs of the previous hospitalizations, but since the P-group accumulated more days, they would have incurred a higher dollar cost than did the H-group for that period. Actual dollar costs for the study periods in the P-program and the H-program were reviewed (Table 28). Because the P-group was in their rehabilitation program during 1971-1973 and the H-group was in their program during 1973-1975, an inflation rate factor of 20% was applied to the P-group figures. This factor was obtained from the hospital where the programs were housed, and represents the general daily fee increase for the defined time period. Even with the inflation factor applied, the costs incurred for the rehabilitation services in the study period for the H-group were considerably greater than for the P-group, both overall and per day. Consequently, if both groups had had an equal number of days in their respective programs, the costs for the P-group would still have been less.

Because of the higher average cost per patient in the H-group, the possibility of greater expense for non-rehabilitation services may be raised. It was speculated that the higher cost of the H-group came about because

TABLE 28.--Average Costs Per Patient in Each Program.

Group	Average Total Cost	Median Total Cost	Average Number of Days in Program	Average Cost per Day for Program	Average Cost for Rehabilitation Services	% of Total Cost Spent for Rehabilitation Services
H	$21,301	$23,718	119	$179	$17,893	84%
P	$ 5,300	$ 3,604	50	$106	$ 4,611	87%

those patients were less medically stable at admission and incurred more cost for services not directly related to their rehabilitation. Therefore, a separate cost figure for rehabilitation services was obtained by adding together the costs of the room, occupational therapy, physical therapy, and equipment. This figure was then divided by the total cost to determine the percentage of the total cost directly attributed to the rehabilitation effort. As seen in Table 28, there was only a 3% difference between the costs specifically for rehabilitation services in the two programs. Therefore, there would not seem to be a significant difference between the two groups as far as the percentage of total cost which went for non-rehabilitation services was concerned.

Another important consideration is the cost of readmissions after discharge from a rehabilitation program. Despite being two years longer post discharge than the H-group, the P-group has one-third fewer total readmission days (Table 29). Since the P-group has fewer total readmission days and a longer time from discharge (P-program = 5, H-program = 3), it is not surprising that, when the average number of readmission days per year is considered, the P-group shows an even greater advantage. Consequently, the P-group has 60% (15) fewer days per year in readmissions. At current hospital costs of $150 per day this means a savings on the average of $2295

(25.0 - 9.7 X $150) per patient per year. In addition, there is the savings to the patient or the family associated with the absence of disruptions to home life, school, job, and social activities.

TABLE 29.--Average Number of Days Spent in Hospital After Discharge from H-program or P-program.

Group	n	Total Readmission Days Since Discharge	Years from Discharge	Readmission Days Per Year
H	10	75	3	25.0
P	10	48	5	9.7

This lower readmission rate suggests that the P-group is better able to cope with the problems associated with disability, and to avoid some of the complications associated with spinal cord injury. This is an especially satisfying finding because another of the major goals of the P-program was to reduce the number of readmissions of its population to the hospital.

Readmissions would be expected to occur more frequently for those spinal cord injured patients who are not prepared to adjust to life outside the hospital. They behave in such a manner as to necessitate return to the hospital for such complications as decubitus ulcers, urological problems, malnutrition, and pneumonia. The

H-group patients spend an average of 25 days per year in the hospital, and the P-group patients spend only 10. This suggests that the P-group was better prepared to meet the demands upon them when they returned to home and community. Consequently, the costs both of rehabilitation and continuing care are considerably less for the P-group. More importantly, the P-group members are surviving and functioning better in their homes and communities.

Summary

This chapter has presented the results of the data analysis and has discussed the findings. The central focus of this analysis was to compare two types of rehabilitation programs--a traditional hospital based program (H-group) and an innovative rehabilitation program (P-group). The groups were compared by assessing demographic characteristics, physical performance, patient's self-esteem, patient's perception of the usefulness of the rehabilitation services, and hospital costs. The major findings of the analysis were:

1. In the H-group there were three fatalities (suicides) and in the P-group there were no fatalities.

2. On the average, the H-group patients were almost three years younger than the P-group patients at the time of injury and nearly four years younger at the

time of admission to the rehabilitation program under study.

3. The groups differ in their present living arrangements. The H-group patients tend to be living with their parents while the P-group patients tend to be living with their spouses.

4. There were no differences between the groups relative to traditional criteria for rehabilitation success as measured by a modified version of ths Smits Rehabilitation Success Scale. However, both groups scored well above the criterion for a successful program.

5. There were no differences between the groups relative to the patient's self-esteem as measured by a modified version of the Rosenberg Self-Esteem Scale. However, both groups scored well above the criterion for high self-esteem.

6. The P-group patients viewed their program as being significantly more useful than did the H-group patients in preparing them for life away from the hospital.

7. The P-group patients surprisingly gained significantly more physical skill than did the H-group patients from admission to discharge.

8. The average cost of rehabilitation services incurred in this study period for the H-group was $21,301 and for the P-group was $5,300.

9. The average number of days spent in the phase of the rehabilitation program studied for the H-group was 119 days and for the P-group was 50 days.

10. The average number of readmission days per year following completion of the study program for the H-group was 25.0 and for the P-group was 9.7.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary and Conclusions

The purpose of this study was to determine long-term effectiveness of an experimental rehabilitation program on patients three or more years after discharge from the program. This was done by comparing patients from the program to those from an ongoing traditional rehabilitation program. A sample of each program's patient population was interviewed, and the following information was collected and analyzed: (1) measures of program success generally associated with a traditional rehabilitation program, including physical, social, psychological, and vocational parameters; (2) measures of patient self-esteem; (3) patient evaluations of the usefulness of the services offered in their respective rehabilitation programs; (4) measures of physical skills of each group upon admission, discharge, and follow-up; and (5) financial data on each rehabilitation admission and other hospitalizations.

The review of literature related to this investigation revealed that studies measuring multiple aspects of program success were not plentiful. Most studies were

concerned with a single factor, such as the ability to function in mobility activities or vocational placement, in spite of the fact that most rehabilitation programs have many and varied objectives. The review, however, indicated that physical skills were lost after discharge from the rehabilitation program, that rehabilitation programs save money when compared to costs of long-term care for non-rehabilitated patients, and that 24% to 40% of the spinal cord injured patients are in school or working part or full time. Smits' (1974) work, which described the results of interviewing a group of patients three to four years after discharge from a rehabilitation center, was broad in scope and addressed some major considerations of program evaluation. Therefore, a version of his measure of rehabilitation success was used in this study. No information concerning rate of readmissions or the patients' perception of the usefulness of the services in preparing for the return to home and community were reported in the literature reviewed.

The study was designed to enable investigation of the effects of two different types of rehabilitation programs--traditional and experimental--on spinal cord injured patients. As stated earlier, all of the patients had been discharged at least three years earlier. Ten patients in each group were interviewed, asked to fill out a questionnaire, and were observed in their homes.

Their hospital records, both medical and financial, covering their stay in their respective institutions were reviewed.

Three hypotheses were tested:

Hypothesis 1: Patients from the experimental group would demonstrate better performance on traditionally defined rehabilitation skills, as measured by their responses on the Modified Smits Rehabilitation Success Scale, than the patients from the traditional group.

Hypothesis 2: Patients from the experimental group would demonstrate a higher level of self-esteem, as measured by their responses to the Modified Rosenberg Self-Esteem Scale, than the patients from the traditional group.

Hypothesis 3: Patients from the experimental group would rate their program as more useful in the transition from the hospital to home, as measured by their responses on the Rehabilitation Services Usefulness Scale, than patients from the traditional group.

In addition to these formal hypotheses, other questions also were investigated. Selected demographic characteristics, costs of rehabilitation, and physical performance skills of the two groups of patients were compared.

The analysis of all data collected provided interesting results. In the H-group, whose patients were an average of three years post discharge, there were three suicides in the first sixteen patients drawn to obtain the sample. In the P-group, the patients averaged five years post discharge and there were no deaths in the first thirteen patients. No information was gathered,

however, on the rest of the population after the sample of ten had been filled. In spite of the small sample size and the limitations this necessitates, it is quite evident that there were program influences which enabled the P-group to cope better with life after disability.

In analyzing the present living arrangements of the patients from the two groups, there were definite contrasting patterns. Living with a spouse was the most frequent condition of residence for the P-group, while living with parents was the most frequent condition of residence for the H-group. Younger age at injury and/or residence with parents at injury were tentative explanations for the high number of the H-group in the living-with-parents category, but both of these explanations were proven false by the data.

This difference in living patterns may have resulted from a lack of independent living training available in the H-program, which was available in the P-program where great emphasis was placed on trial runs of the various everyday activities people engage in when they live outside the hospital environment. Preparing and practicing for the demands and challenges of living with a severe disability seem to have given the P-group patients the extra confidence necessary to leave the protected environment of the hospital for a more independent arena of living. This is the type of outcome the

P-program designers hoped for--patients determining how they wanted to live and achieving that particular life style or life goal.

No differences were found between the groups in meeting the criteria of success generally associated with a traditional rehabilitation program. Using the eight item Modified Smits Scale, both groups scored in the "highly successful" range. It must be noted that the P-group may have been disadvantaged by their greater number of older patients who would be expected to be less active both physically and socially. Additionally, a time bias against the P-group may have been affecting the rehabilitation success scores. As noted earlier in this chapter, the literature suggests that as time after discharge increases, skills tend to decline. Glick and Singer (1963) found that their group of patients were functionally at levels below their optimum when they were surveyed three to four years post discharge. Similar findings were reported by Slater et al. (1970) in his review of a group of disabled patients who were five years post discharge, and by Buck (1970). Grynbaum (1963), describing follow-up examinations of spinal cord injured who were six and one-half years post discharge, found that no one in the group had maintained their skill level. In a shorter follow-up time, Abramson's (1968) experimental group did maintain skills; the

control group, however, reported losses. Those studies that reported longer post-discharge periods tended to report loss of skill. Since the P-group patients were two years longer post discharge than the H-group patients, the loss of skill was not unexpected.

Further evidence for the decline of skill performance as length of time from injury increases was found in the scores on the Modified Smits Scale in the social and physical activity categories which showed poorer scores for the P-group which was longer from injury. In addition, on the Modified Donaldson Form (physical performance scores), the P-group patients made their greatest gains and reached their highest level of performance during the rehabilitation program, but underwent slight reversion after discharge.

Even though the physical activity level of the P-group is poorer than that of the H-group on the Modified Smits Scale, the objective data on physical activity rate the P-group better than the H-group. A reason for this is that, as a result of the P-group attaining such a high level of skill during that rehabilitation program experience, they subsequently may feel that they are not now performing as well, even though their skill level remains quite high. Meanwhile, the H-group patients continued to improve after leaving their program, and consequently they feel they are performing very well,

even though they are less skillful than the P-group patients. Regardless of these differences, however, both groups scored well enough on the Modified Smits Scale to be considered successful. Therefore, the P-program did meet the traditional standards of success as well as the more traditional H-program.

The Modified Rosenberg Self-Esteem Scale also showed no differences between the groups. Again, both groups scored well enough to be considered successful, with both rating in the "high self-esteem" category. It may be reasonable to assume that a threshold effect may be operating. That is, a minimum amount of physical functioning would produce, in most disabled persons, a high level of perceived self-worth. This study did not investigate such a possibility. Even though the P-group patients were expected to demonstrate higher self-esteem than the H-group, the data indicate that both groups now possess high self-esteem.

When the groups were compared on the Rehabilitation Services Usefulness Scale as to their opinions about the usefulness of their respective rehabilitation programs in helping them to return to home and community, the P-group patients gave their program a significantly better rating than the H-group patients gave their program. The P-group patients felt very strongly that they had been

ably assisted in making the transition from life in the institution to life outside the institution. The strongest difference between the groups came on the item which asked the patients if they had had the opportunity to make decisions about their rehabilitation programs. This was to be expected as one of the basic goals of the P-program was to allow patients to play the major role in establishing their own priorities in the rehabilitation program.

We can also attribute some of the better rating of the program by the P-group patients to the avowed purpose of the P-program to give the patients the opportunity to actually practice skills and activities which will be necessary to function outside the hospital environment and the opportunity to decide which skills were important and necessary for them.

One of the important factors in rehabilitation is the cost. In comparison with the H-group patients, the P-group patients had a one-third less cost per day adjusted for inflation, three-fifths fewer average days in the program, and three-fifths fewer readmission days. The reasons for the lower cost per day were not investigated. However, the lower number of days in the program and the lower number of readmission days possibly can be attributed to the objectives of the P-program which were

formulated to allow patients to choose and work on their own goals and spend their time working to achieve those specific goals without "wasting" time on activities for which they had no interest and perhaps no need. This group also was longer from injury and had more previous hospital days than did the H-group. It would seem that these factors would help to explain the fewer days in the program of the P-group patients.

One of the most important findings in this investigation was the comparatively low number of readmission days of the P-group patients. Reduction of readmissions was a stated objective of the P-program and, although the number of subjects is small, a definite trend is demonstrated. The financial advantage of fewer readmission days is obvious, as is the associated economic benefit of the stability in job, family, and/or school when there are no disruptions for hospitalization. Most readmissions occur as the result of an inability to contend with the exigencies and everyday demands of disability which lead to the complications (decubitus ulcers, urological problems, respiratory problems, depression, etc.) for which the person is hospitalized. The lower readmission rate for the P-group suggests that this group was healthier mentally and physically and able to cope better with these problems. That group, despite its older population

and longer time since discharge, achieved a lower readmission rate when compared with the traditional program.

Thus, based on the findings, the following conclusions can be drawn:

1. The P-program is as successful in providing all the rehabilitation skills made available in a traditional program.

2. The P-program has been able to instill in their patients at least as high a regard for themselves and their abilities as has a traditional program.

3. The P-program is providing services that patients judge to be very useful after their return home.

4. The P-program is more successful in stimulating patients to perform at high levels of independence, both physically and socially than is a traditional program.

5. The P-program is more financially effective when compared to a traditional hospital program, i.e., it costs less per day, requires fewer days, and results in fewer readmissions to the hospital.

The P-program was able to accomplish all these things in spite of having an older population which has the following limitations: (a) less flexibility, strength, and stamina to perform independent activities;

(b) less adaptability to change; (c) a greater possibility of complications; and (d) more likelihood of holding self-limiting attitudes.

Recommendations

The results of this study suggest that research be conducted as detailed below.

1. More sensitive instruments for data collection in the non-medical, non-physical areas of rehabilitation are needed. This study was not able to determine with precision which aspects of the psycho-social emphasis of the P-program were best for patient performance and adjustment. What is needed is the ability to document whether or not an acceptable quality of life is being maintained by the patients after they are discharged from a rehabilitation program, and what contributions in the psycho-social area are germane to this quality of life.

2. Data collection and analysis concerning patient evaluation of all the various rehabilitation programs in which they participated was not included in this study, but would provide a rich source of information. Most of the patients had been in several programs and had made definite judgments about which facets of each program were helpful and which were not.

3. Separate but parallel interviews and/or questionnaires prepared for and completed by the families

of the patients would give a broader perspective on the success, or lack of success, of the rehabilitation program. During the interviews undertaken for this study, there were indications that the family and the patient did not always agree on the value or completeness of particular parts of the program. This information could assist rehabilitation centers in preparing and offering services to meet the needs of the families of the severely disabled as well as the patients themselves.

4. Data on the structure, organization, and availability of rehabilitation services are urgently needed. At present, patients are admitted to the hospital immediately after their injury and are expected to stay until they are "fully rehabilitated." This is a reflection of the policy of the health insurance carriers who will not pay for a second admission for "rehabilitation." Almost every patient interviewed felt that they could have utilized the rehabilitation services more effectively and efficiently if they could leave the hospital for a short period of time after they were medically stable, remain home for a short time, and later return for rehabilitation activities. Furthermore, they felt that several shorter admissions, rather than one protracted stay, would have resulted in less time in the hospital and better utilization of the time during which they were hospitalized.

Longitudinal studies that consider multiple measures of rehabilitation success are not reported in the literature. Rehabilitation planners and educators need to have information relating to the long-term consequences of severe disability in order to plan effective programs. Most studies presently available are short-term (one year) follow-up studies and are concerned with a single measure of rehabilitation, for example, self-care or vocational performance.

Many of these studies, especially those concerning vocational outcomes, are conducted on a mixed population which includes mental as well as physical disabilities. Conclusions reported from such data do not provide the direction necessary for rehabilitation program planners. It is crucial that information be gathered on the long-term effects and outcomes of disability, particularly on the quality of the patients' lives, social and emotional as well as physical.

APPENDICES

APPENDIX A

ITEMS CONSTITUTING THE MODIFIED SMITS REHABILITATION SUCCESS SCALE

1. Compared to when you were admitted to the rehabilitation center, how would you describe your present level of physical functioning?

   ( ) Great improvement
   ( ) Some improvement
   ( ) No change
   ( ) Some deterioration
   ( ) Great deterioration

2. Compared to when you were discharged, how would you describe your present level of physical functioning?

   ( ) Great improvement
   ( ) Some improvement
   ( ) No change
   ( ) Some deterioration
   ( ) Great deterioration

3. How well can you alone care for your personal needs?

   ( ) Care for all personal needs
   ( ) Need only minimal help
   ( ) Partial self-care; feed and dress self some
   ( ) Need help for most of personal care
   ( ) Need help for all of personal care

4. At the present time how often do you engage in activities outside the home? (shopping, work, fishing, movies; not trips to hospital or doctor)

   ( ) Twice or more weekly
   ( ) Once weekly
   ( ) Once monthly
   ( ) Less than once a month
   ( ) Never, or almost never

5. How do you feel about your disability when you go outside the home?

   ( ) I am hardly aware of it
   ( ) I am always aware of it
   ( ) It bothers me somewhat
   ( ) It bothers me a lot
   ( ) It bothers me so much that I rarely go out

6. How well do you feel that you understand your physical condition?

( ) I know or understand completely
( ) I know quite a bit, but would like to know more
( ) I know enough about it
( ) I know something about it
( ) I know almost nothing about it

7. Do you feel that you take part in family decisions?

( ) All the time
( ) Quite often
( ) Sometimes
( ) Not very often
( ) Never

8. What is your current employment status?

( ) Employed full time
( ) Part time, between 20 and 35 hours per week
( ) Part time to 20 hours per week
( ) Retired
( ) Unemployed

APPENDIX B

ITEMS CONSTITUTING THE MODIFIED ROSENBERG SELF-ESTEEM SCALE

1. I feel that I'm a person of worth, at least on an equal plane with others.

   ( ) Strongly agree
   ( ) Agree
   ( ) Disagree
   ( ) Strongly disagree

2. I feel that I have a number of good qualities.

   ( ) Strongly agree
   ( ) Agree
   ( ) Disagree
   ( ) Strongly disagree

3. All in all, I am inclined to feel that I am a failure.

   ( ) Strongly agree
   ( ) Agree
   ( ) Disagree
   ( ) Strongly disagree

4. I am able to do things as well as most other able-bodied people.

   ( ) Strongly agree
   ( ) Agree
   ( ) Disagree
   ( ) Strongly disagree

5. I am able to do things as well as most other spinal cord injured people.

   ( ) Strongly agree
   ( ) Agree
   ( ) Disagree
   ( ) Strongly disagree

6. I feel I do not have much to be proud of.

   ( ) Strongly agree
   ( ) Agree
   ( ) Disagree
   ( ) Strongly disagree

7. I take a positive attitude toward myself.

( ) Strongly agree
( ) Agree
( ) Disagree
( ) Strongly disagree

8. On the whole, I am satisfied with myself.

( ) Strongly agree
( ) Agree
( ) Disagree
( ) Strongly disagree

9. I wish I could have more respect for myself.

( ) Strongly agree
( ) Agree
( ) Disagree
( ) Strongly disagree

10. I certainly feel useless at times.

( ) Strongly agree
( ) Agree
( ) Disagree
( ) Strongly disagree

11. At times I think I am no good at all.

( ) Strongly agree
( ) Agree
( ) Disagree
( ) Strongly disagree

APPENDIX C

ITEMS CONSTITUTING THE REHABILITATION SERVICES USEFULNESS SCALE

1. To what extent were your goals accomplished?

   ( ) Completely
   ( ) Almost completely
   ( ) Somewhat
   ( ) Very little
   ( ) Not at all

2. Do you feel that you had the opportunity to make decisions about what you worked on in your own rehabilitation program?

   ( ) Practically all
   ( ) Most all
   ( ) Some
   ( ) A few
   ( ) None

3. Do you feel that you learned things at the rehabilitation center that were helpful when you returned home?

   ( ) Practically everything
   ( ) Most things
   ( ) Some things
   ( ) A few things
   ( ) Practically nothing

4. Do you feel that the staff was concerned about the things you wanted to learn?

   ( ) Always
   ( ) Almost always
   ( ) Sometimes
   ( ) Almost never
   ( ) Never

5. Do you feel that the staff (OT, PT, Nurse, Aides, Physician, Rehabilitation Counselors, Social Worker) was working together to assist you in learning new skills?

   ( ) Always
   ( ) Almost always
   ( ) Sometimes
   ( ) Almost never
   ( ) Never

6. Do you feel that the staff helped prepare you to live away from the hospital?

( ) As much as possible
( ) Quite a bit
( ) Somewhat
( ) A little
( ) Not at all

7. Do you feel that the staff helped you understand your injury and its complications (pressure sores, urinary diversion, social problems, your feelings, etc.)?

( ) As much as possible
( ) Quite a bit
( ) Somewhat
( ) A little
( ) Not at all

8. Do you feel that you and the staff were working together?

( ) Always
( ) Almost always
( ) Sometimes
( ) Almost never
( ) Never

9. Do you feel that the staff worked on your goals?

( ) Always
( ) Almost always
( ) Sometimes
( ) Almost never
( ) Never

10. On the whole, were you satisfied with the services you received? (OT, PT, etc.)

( ) Completely
( ) Almost completely
( ) Somewhat
( ) Very little
( ) Not at all

APPENDIX D

RATING CRITERIA AND ITEMS USED IN THE MODIFIED DONALDSON ADL EVALUATION FORM

The criteria:

"0" Not evaluated - The evaluator failed to observe the performance or failed to grade it.

"1" The patient is able to and does perform the activity.

"2" The patient is able to and does perform the activity, but requires an assistive device and is able to and does apply the device by himself.

"3" The patient performs the activity, but someone must be in the room with him, be it for encouragement, safety, supervision, or direction. There is no physical contact between the patient and the person with him.

"4" The patient performs part of the activity, but someone must be with him to assist with the activity. There is physical contact between the patient and the assistant, but no lifting is involved.

"5" The patient performs part of the activity, but someone must be with him to assist with the activity. The assistance given requires lifting part or all of the patient.

The items:

1. Feeding

2. Dressing/undressing

3. Bowel and bladder care

4. Bathing

5. Writing

6. Transferring to/from bed

7. Transferring to/from toilet

8. Transferring to/from tub
9. Transferring to/from car
10. Maneuvering wheelchair on levels
11. Maneuvering wheelchair through doors
12. Maneuvering wheelchair up/down curbs
13. Driving

APPENDIX E

SMITS' REHABILITATION SUCCESS FACTOR INTERCORRELATIONS

TABLE 30.--Smits' Rehabilitation Success Factor Intercorrelations.

(N=110)

Success Variables

	1	2	3	4	5	6	7	8
1	--	.13	.41***	.25**	.26**	.36***	.37***	.46***
2		--	.33***	.22**	.21*	-.04	.13	.15
3			--	.38***	.39***	.12	.40***	.61***
4				--	.67***	.27**	.51***	.45***
5					--	.12	.61***	.50***
6						--	.25**	.20*
7							--	.59***
8								--

Variable Code:

1. Employment status
2. Physical functioning
3. Self-care
4. Activities outside home
5. Self-consciousness
6. Knowledge about condition
7. Social relationships
8. Participation in family

*=p <.05; **=p <.01; ***=p <.001

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