

EVALUATING THE OUTCOME OF VOCATIONAL REHABILITATION

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ABSTRACT. This paper presents an analysis of studies in which vocational rehabilitation was followed up during the 1980s and early 1990s. Its purpose is to clarify the outcome of vocational rehabilitation as well as the factors predicting that outcome. In these follow-up studies the variables by which the outcome is measured are closely linked with the subjects' employment opportunities, and are basically the same as those applied in earlier follow-up studies. Because of the study designs it is difficult to make any generalizations concerning the results. Little attention has been paid to the evaluation of psychological adaptation in most of these studies. Also, follow-up studies generally have not taken into account the employment situation. Whether those who have had rehabilitation are able to find employment depends essentially on employers' policies towards the handicapped and the disabled.

Key words: vocational rehabilitation, outcome studies, musculoskeletal diseases.

Vocational rehabilitation is purposeful action (17). Its outcome should thus be measured and evaluated according to the goals set for that action. Follow-up studies broadly attempt to answer the question of how well rehabilitation has succeeded. The outcome criteria depend on how rehabilitation is defined or which factors are considered to indicate a good outcome and, thus, which factors rehabilitation is thought to influence. The primary goal of vocational rehabilitation is often viewed as the maximization of the functional capacities and as the promotion of the long-term adaptation of the handicapped (3, 6). In practical terms, the central aim of vocational rehabilitation is to enable the handicapped or disabled person to acquire and retain a suitable job. In more general terms, rehabilitation is considered to maximize physical, psychological, social and vocational functioning capacities (25). Vocational and psychosocial adaptation together have been considered to form the nucleus determining the success of rehabilitation (3).

Follow-up studies contribute much important information about the practice of rehabilitation. Improved predictability, for example, is one substantial contribution, even though follow-up studies have been criticized for their inability to answer practical issues (25). When rehabilitation is being planned, follow-up studies offer valuable information, e.g. how to choose the target population for rehabilitation (3, 27). However, follow-up studies leave the impression that our knowledge of the outcome of rehabilitation is random: The target populations, the follow-up periods, and the evaluations of outcome, for instance, vary widely. For this reason, the present study aims at focusing on follow-up studies systematically by analyzing the methods applied, the outcome obtained, and the factors used to predict that outcome in various types of vocational rehabilitation. We limited our scope of investigation to follow-up studies of vocational rehabilitation for people with musculoskeletal deficits carried out in the 1980s and early 1990s. Summaries of earlier studies have been presented by Bailey (2), Bolton (3), Overs (23) and Spaniol (29).

The specific objective of the present study is to answer three questions:

- 1) How has the outcome of vocational rehabilitation been evaluated?
- 2) What types of factors are considered to predict this outcome?
- 3) How successful has vocational rehabilitation been?

METHODS

The sample in the study was collected from the MEDLINE database. The keyword was 'vocational rehabilitation', which together with the words 'follow-up studies' or 'musculoskeletal system' yielded a total of 298 references. On the basis of their abstracts, 70 articles were reviewed; 23 of these proved to be relevant to the present study in that they were related to the vocational rehabilitation of people with musculoskeletal deficits. The articles that were excluded dealt with other sorts of rehabilitation, e.g. psychological rehabilitation for patients with heart disease.

RESULTS

Variables measuring and predicting the outcome of rehabilitation

One problem in studying the outcome of vocational rehabilitation is how vocational rehabilitation should be defined. In the present study, vocational rehabilitation is classified into four categories according to the type of rehabilitative intervention used to send the subjects back to working life. These classes are:

- I) Comprehensive vocational rehabilitation, consisting of medical, social, psychological, and vocational counselling and examinations.
- II) Intervention to alleviate chronic pain and to enhance working and functional capacity.
- III) Therapy promoting functional capacity (including medical care).
- IV) Rehabilitation of severely handicapped.

The follow-up studies under consideration were classified I–IV as defined above; see Table I. Table I indicates the rehabilitation intervention and the procedures taken, to the extent these have been reported, as well as the factors used to evaluate their effects and to intermediate the process. Table I also lists the duration of the follow-up periods and the number of subjects.

The subjects included in the studies and presented in Table I were mostly of working age. The group studied by Järvikoski et al. (16) was, however, a little older (mean age almost 60 years), whereas groups studied by Mackelprang & Hepworth (19) and by Wahle (30) were somewhat younger (mean ages approximately 30 and 26 years, respectively).

The studies presented in Table I differ from each other with respect to the rehabilitative procedures taken, the variables explaining or mediating their effects and, especially, the outcome variables. It is a matter of interpretation whether the studies concerned with therapeutic regimens such as operative procedures, treatment to relieve pain, or physical therapy pertain to vocational rehabilitation in cases when their effects have been evaluated by means of return-to-work rates and other psychosocial variables. One should remember, however, that these are the same criteria (e.g. employment rates) which are used to assess the outcome of comprehensive vocational rehabilitation.

In the studies on comprehensive vocational rehabilitation, the follow-up periods have been at most 3–4 years. Lack of specificity about the rehabilitative treatment is typical of these studies. Although the study subjects have undergone a variety of treatments, the studies do not differentiate, for instance, among the initial conditions of the subjects at the beginning of rehabilitation. For example, what kinds of problems were considered fundamental, what treatments were attempted for the problems, how likely were the recommendations to be implemented; such questions are usually neglected in the studies. Cook (6) attempted to observe how the recommendations were implemented qualitatively (for example, the work desired vs. that obtained, the schooling or vocational training recommended vs. the outcome of the recommendation). Brodhold et al. (5) studied, on a more general level, to what extent the recommendation for medical care, vocational training, etc. was realized during the follow-up period.

The factors explaining or mediating the outcome of rehabilitation were generally related to the subject's personal characteristics or social circumstances. In the follow-up studies, the situational factors associated with the handicap, and their evolution, were very rarely taken into account (for example, adaptation to the handicap, social alienation or integration, impact on the subject's economic status, abandoning previous plans and profession, making new plans, etc.). The variables selected in the studies may have been connected to these issues in some way but they were not directly concerned with the problems and options that confronted the subject.

As shown in Table I, the follow-up periods were longer than average in cases of medical intervention and when the study concerned rehabilitation for the severely disabled.

Although the number of studies was small, the results nevertheless indicate that the variables used to evaluate the outcome were fairly similar regardless of how comprehensive the rehabilitation was. Thus follow-up studies of comprehensive vocational rehabilitation, for example, have not necessarily focused on the process of adaptation, which might be expected to be relevant to the conduct of comprehensive treatment. In this respect rehabilitation to relieve pain and rehabilitation for the severely disabled have come the closest to dealing with this issue. As to shortcomings in the evaluations of outcome, the rehabilitation methods were again inadequately reported.

The outcome variables presented on a general level in Table I are described in more detail in Table II.

As shown in Table II, the most common measure of outcome is job placement vs. retirement. In what way and how quickly job placement was achieved is not usually reported. Also, only rarely is attention paid to such factors as whether the subject returned to the original job or a new job, what vocational training was recommended, whether any training was received, and so forth.

The follow-up studies of comprehensive rehabilitation measure and evaluate the return to work in more detail (26, 27): Factors such as the rapidity and stability of employment are taken into account, and the length of the workday or workweek is specified. Owing to the relative brevity of the follow-up periods, much attention is paid to short-term job placement.

In rehabilitation to relieve pain, typical follow-up variables are those measuring the health status and its maintenance. These factors may also be fundamental to comprehensive vocational rehabilitation, though they are rarely applied. The outcome variable 'end result of rehabilitation' (6) means that the recommendations made at the end of the treatment and the results after the follow-up period are related to the explanatory variables in the same way. The aim was to study whether the recommendations and their implementation can be explained in a similar manner.

The outcome of rehabilitation and its explanatory variables

I. The outcome of comprehensive vocational rehabilitation. The outcome of comprehensive vocational rehabilitation was variable and depended strongly on the moment of evaluation. According to Cook (6), for example, 70% of the subjects had held at least one job following rehabilitation; about 56% of the subjects were occupied more permanently with work outside the house, with housework or with studies. Foldspang et al. (10) reported an employment rate of 44%, Sheikh & Mattingly (27) a rate of 24%, Morgan & O'Connell (21) a rate of 53–63% and Brodhold et al. (5) a rate of 22%. Generalizing about the outcome is hampered by the fact that the rehabilitative procedures were not uniform. Some studies tracked changes in the subject and/or the subject's situation, while others limited their scope to evaluation of the subject's working capacity and the recommendations based thereon. Cook (6) reported a weak correlation between the

rehabilitation outcome that was predicted and the actual outcomes evaluated in the follow-up studies. The initial variables used in predicting outcome did not correspond to the variables affecting outcome that were studied at follow-up. The favorable outcome indicated by long-term employment (3 years) depended on the speed of job placement following rehabilitation: 45% of the subjects showed positive long-term results if the unemployment period was less than 3 months, 34% of the ones who were unemployed for 6 months, and only 16% of those who were out of work more than 2 years (26, 27). According to Brodhold et al. (5), 26% of those to whom medical care was recommended had that care, and 41% of those to whom vocational training was recommended had training during the follow-up.

The studies revealed that motivational factors, age, and functional capacity, and also the duration of unemployment prior to rehabilitation, essentially accounted for the outcome (5, 6, 10, 26, 27). Age was related to motivation and to the duration of unemployment before rehabilitation (27). Social class, educational level and intelligence by themselves did not explain the outcome (26, 27). Only Cook (6) reported how rehabilitation affected various measures of well-being or how employment had been found.

II. The outcome of rehabilitation to relieve chronic pain, measured by its effect on employment. Among chronic pain patients undergoing rehabilitation to relieve pain, the percentage of those reporting a positive effect on their work situation ranged between 15% (1) and 55% (13). The success rates were higher among subjects who remained in the rehabilitation program longer (more than 4 weeks) (7). According to Deardorff et al. (7), those who had had rehabilitation were employed at follow-up more often than those who had not had rehabilitation (43% vs. 0%), and they were also ready for work more often (28% vs. 0%). Åberg (1) found that among the control group, the percentage of untreated subjects who reported improvement in their work situation (9%) was almost as high as the percentage of patients in the rehabilitation group (15%). However, the unemployed who underwent rehabilitation believed that they would find employment more often than those who had not had rehabilitation (42% vs. 10%). According to Snow et al. (28), out-patient rehabilitation following the standard rehabilitation program promoted employment. Järvikoski et al. (16) reported, however, that the partici-

Table 1. The follow-up studies on vocational rehabilitation: classification of rehabilitation and the variables moderating and measuring the outcome: I = comprehensive vocational rehabilitation; II = intervention to alleviate chronic pain; III = therapy to promote functional capacity (including medical care); IV = rehabilitation of severely handicapped.

Class/Reference	Rehabilitative intervention	Factors influencing the outcome of the intervention	Measures of the outcome	Follow-up period	n	
I	6	Comprehensive in-patient rehabilitation —medical restoration —physical therapy —rehabilitation counselling —occupational therapy —vocational evaluation and work adjustment training	—sex, age —socioeconomic status —marital status —education —expectations as related to work —IQ, reading and writing —type of disability —number of weeks spent at the center —number of jobs held prior to enrollment —months worked prior to enrollment	—type of center outcome —employed/unemployed —training recommended —ADL —income —future aims —job sought/found —satisfaction with services	2-4 yrs	105
26, 27	Assessment of physical and psychological working capacity	—sex, age —social class —education —IQ —motivation as assessed by different counselors —occupational history —duration of unemployment —income —mobility for employment	—employed/unemployed —date of employment —number of jobs —job satisfaction	0.5-3 yrs	2,113	
10	In-patient rehabilitation	—age —marital status —education —mental diagnosis —medical diagnosis —occupational history —social, economic and demographic factors	—recommendations for training, to work or not to work	3 yrs	234	
21	Outcome of state vocational rehabilitation program, I)	—social, economic and demographic factors	—employed/unemployed —income —reasons for unsuccessful rehabilitation	no follow-up	7,627	
5	Rehabilitation in interprofessional groups	—sex —age	—employed/unemployed —medical care —vocational training	12 mo	261	

Table I (cont.)

Class/Reference	Rehabilitative intervention	Factors influencing the outcome of the intervention	Measures of the outcome	Follow-up period	n
II 28	In-patient and out-patient treatment for chronic pain —physical and occupational therapy —psychotherapy —stress management and hypnosis —vocational counselling and related therapies	—sex, age —marital status	—changes in activity status —changes in pain-related behavior —emotional and behavioral symptoms	10 mo–3 yrs 3 mo	120
I 1	In-patient treatment of back pain 2)	—	—employed/unemployed —income —working capacity, ADL —attitudes to correct working techniques in order to prevent pain —social activities	4–12 mo	353
16	In-patient and out-patient treatment for low back pain	—employed/unemployed	—psychological symptoms —working ability —maintenance of the skills learned —return to work	0–12 mo	151
13	Comprehensive rehabilitation program for low back pain —biofeedback training —counselling in self-control techniques —self-regulated medication reduction —physical therapy —vocational rehabilitation —education	—length of stay in rehabilitation —psychological factors —pain —medication level —visits to a physician —utilizing of relaxation skills		6–12 mo	78
7	Comprehensive multidisciplinary treatment for chronic pain 2) —physical therapy —occupational therapy —psychological intervention —medication management —medical consultation	—age —sex	—pains —physical functioning —return to work —satisfaction with services —change in the experiencing of pain	10 mo	42
22	Hospitalization for low back pain	—sex —age —education —social class	—return to work —pension —sick leave —pain —date of employment	2.5 yrs	62

Table I cont on next page

Table I (cont.)

Class/ Reference	Rehabilitative intervention	Factors influencing the outcome of the intervention	Measures of the outcome	Follow-up period	n
III					
14	Operation for lumbar intervertebral displacement	—sex —time from operation	—employed/unemployed —pain	4–12 yrs	246
18	Rehabilitation for damage to the lower limbs —functional rehabilitation therapy	—age	—working ability prior to and after treatment	—	519
8	Post-acute in-patient rehabilitation	—	—employed/unemployed	2–4 yrs	4,661
4	Long-term results of ankle arthrodesis	—	—employed/unemployed	1–17 yrs	37
9	In-patient rehabilitation in the early phase after IV D surgery	—sex	—working ability —need for another operation	—	228
15	Social rehabilitation and work readjustment in polytraumatized patients	—	—employed/unemployed —ADL —social reintegration	—	75
24	Bilateral carpal tunnel release	—quality of work	—working ability —return to work	6 mo–3 yrs	228
IV					
12	Hospitalization for spinal cord injury	—vocational and educational plans —interests —work values —rehabilitation outlook	—school and employment history —occupational status	8 yrs	24
19	Hospitalization for spinal cord injury	ecological factors in rehabilitation —size of the community: —way of living: independence vs. physical dependence —employment status —social integration	—emotional adjustment —social adjustment	1–6 yrs	81
20	Physical training programs for paraplegics	—age —level of the lesion —IQ	—functional capacity —occupational status	3–16 yrs	61
30	Hospitalization for paraplegia	—	—integration in school and employment	10 yrs	50

1) With disabled native Americans as subjects.

2) With a control group receiving no treatment.

Table II. The outcome measures of the follow-up studies (class = see Table I)

Class	I					II					III					IV							
	6	27	10	21	5	28	1	16	13	7	22	14	18	8	4	9	15	24	12	19	20	30	
1. Ability to work after being disabled			2			2	2	2		1		1											
2. Self-rated ability at work						3	3	3		4		2			2			2			2		
3. ADL	3					4	4	4		4		4					3				3		
4. Pain						6	6	6		7		7											
5. On sick-leave/not on sick-leave						6	6	6		7		7											
6. Need for medical care						7	7	7		7		7											
7. Health-care related behavior						7	7	7		7		7											
8. Return to work (as a wage earner)	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
9. —to a previous job	9																						
10. —to a new job	10																						
11. —job title	11																						
12. Part-time																							
13. Homemaker	13					13																	
14. Unemployed	14						14																
15. Not working, insurance	15						15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
16. Work adjustment training	16																						
17. Vocational training	17																						
18. —training recommended	18																						
19. Delay in starting work	19																						
20. Number of jobs	20																						
21. Time devoted to work	21																						
22. Level of income	22						22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
23. Job satisfaction	23																						
24. Mental well-being, quality of life	24					24																	
25. Emotional and behavioral problems	25																						
26. Social behavior	26					26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
27. Future aims	27																						
28. Spending of leisure time	28																						
29. Satisfaction with rehab. services	29																						
30. Reasons for unsuccessful rehabilitation	30																						
31. Types of center outcome	31																						

pants of rehabilitation who already had a job did not gain any benefit from pain-relief treatment. Nielsen et al. (22) reported that about half of the subjects (53%) occupationally active at the time of admission were still employed two and a half years later. Rejection from the labor market was associated with the presence of pain, failure to resume work within 7 months after hospitalization, a sick-leave lasting longer than 120 days, a low educational level, and age over 45 years. In general, rehabilitation to relieve pain seems to be often more effective in achieving its primary objective: Coping with the pain improved, and subjectively experienced pain decreased among the patients (1, 7, 28), although only temporarily in some cases (16).

III. The outcome of therapy promoting functional capacity, including medical care, measured by its impact on employment. The results of medical care and therapy promoting functional capacity have been good in terms of employment. For example, 90% of patients returned to work after a discus operation (14), and 83% after bilateral carpal tunnel release (24). The good outcome of purely medical care, e.g., surgery, compared to the outcome of comprehensive vocational rehabilitation could be due to the fact that the subjects who receive comprehensive rehabilitation may suffer from more complex medical and psychological problems. The outcome of therapy promoting functional capacity, including medical care, seems to be related to age, sex, the degree of handicap and, to some extent, also intelligence (18). The explanatory factors for returning to work are essentially the same as those detected in the case of comprehensive vocational rehabilitation.

IV. The outcome of rehabilitation of the severely handicapped, measured by its effect on employment. The results of vocational rehabilitation for the severely handicapped show that most of the subjects integrated well into their jobs and their studies. Wahle (30) and Mackelprang & Hepworth (19) reported that 66% of the subjects were engaged in normal work or in studies following rehabilitation. After stair-climbing rehabilitation, 59% of the paraplegics were able to return to work (20). The main explanatory factors were good motivation, a realistic rehabilitation plan prepared early in the rehabilitation process, and the subject's own attitude towards his disability (12, 30). Good social integration promoted employment and indi-

cated psychological well-being (19, 30). Again, the results bear some resemblance to those for comprehensive vocational rehabilitation.

CONCLUSIONS

The outcome of comprehensive vocational rehabilitation has been variable. Owing to the wide variations in rehabilitative procedures it is difficult to compare the studies evaluating the outcome of comprehensive vocational rehabilitation and, furthermore, the outcome depended both on the method of evaluation and on the duration of follow-up. On the basis of the studies it is difficult or impossible to measure the overall usefulness of comprehensive vocational rehabilitation in producing successful instances of rehabilitation. It is also difficult to evaluate the usefulness of the rehabilitative procedures, because the determinants of successful rehabilitation (such as age and motivation) are mostly external to the process: they are not intrinsic to the procedures themselves, nor do they explain how these procedures influence the subject's situation. Young, well-motivated and healthy subjects will most probably return to work without any rehabilitative intervention. The follow-up studies did not evaluate the change occurring between the beginning and the end of rehabilitation as an explanatory factor affecting the outcome of rehabilitation.

The measures of outcome applied in these studies were basically the same as those applied in previous follow-up studies, as summarized by Bolton (3). Neglecting qualitative vocational adaptation and psychological adaptation are often shortcomings in the evaluations. Bolton (3) has previously presented the same criticism of the evaluations of outcome. The importance of qualitative factors is apparent, for example, in the observation that subjects undergoing rehabilitation (generally chronic-pain patients) may be more optimistic about finding employment than those not receiving treatment, although rehabilitation *per se* does not alter their employment status.

Development of rehabilitation has overlooked some important perspectives pertaining to the patient: subjective obstacles to finding employment, the need for supplementary services, changes occurring during the process of becoming independent, and other reactions. Earlier studies indicate that more than one-third of the subjects have experienced a need for extra help after rehabilitation (3). This observation is supported by the

findings of Snow et al. (28): the rate of employment was higher among subjects who participated in outpatient rehabilitation after standard treatment in an institute. The results also suggest that rehabilitation should be developed towards making it more of an ongoing process than has been the practice so far.

Factors related to motivation and age are not unambiguous as predictors of outcome. Age as an explanatory factor does not explain how older subjects who benefit from rehabilitation differ from those who do not. Although factors related to motivation and age do correlate with each other (27), this does not explain why some older people are motivated and whether their motivational basis is different from that of younger people. Although motivational factors are perceived to have an essential effect on the outcome, the follow-up studies fail to consider how motivation may be influenced. The explanatory factors in motivation may be very different. For example, motivation may depend on the adaptation to the handicap, on general attitudes towards work, and also on the length of unemployment before and after rehabilitation.

Nor is functional capacity an unambiguous explanatory variable of outcome, either. Although the outcome of comprehensive vocational rehabilitation and functional capacity correlate positively with each other, the studies reviewed here indicate that the outcome of rehabilitation of the severely handicapped has also been good. It may be that severe disability poses a special challenge, and thus the outcome may depend upon highly personal factors.

The follow-up studies on comprehensive vocational rehabilitation, on therapy promoting functional capacity, including medical care, and rehabilitation to relieve pain all agree that rehabilitation should be started as soon as possible after the acute treatment. Initial rehabilitation should be followed by later sessions of rehabilitation and guidance, which seem to be efficient measures for enhancing the outcome.

The effect of general unemployment on the outcome of rehabilitation was evaluated only by Sheikh & Mattingly (27). The stability or variability in the rate of unemployment, and its covariance with the other explanatory variables, makes it difficult to consider unemployment as an explanatory factor. It can be assumed, however, that it is more difficult to return to work when the unemployment rate is high. A high unemployment rate may also diminish the motivation for vocational reorientation. If the subjective work capacity is influenced by rehabilitation, the subjects

may have greater belief in their possibilities to find a job (1), and they may eventually get better employment than those who have not had rehabilitation.

The evaluation of the outcome of vocational rehabilitation may be summarized as follows:

1. No follow-up studies based on the changes between the initiation and end-point of vocational rehabilitation have been reported. Information about rehabilitation procedures, how the subjects were helped or how their situation was improved, is seldom reported. If one is interested in acquiring more practical knowledge, more detailed follow-up studies should be done. The rehabilitative measures have been described most clearly in studies on therapy promoting functional capacity and medical care as well as on rehabilitation to relieve pain.
2. The variables predicting the outcome of vocational rehabilitation are often external to and independent of the rehabilitation process (age, level of education, health status, etc.). The choice of variables is related to the remarks presented in point 1 (above). Motivation towards rehabilitation may be the most practical explanatory variable.
3. In the follow-up studies, the evaluation of outcome is confined to those variables pertaining directly to employment. Changes in psychological adaptation are rarely followed, although they are key factors in rehabilitation. Adaptation has been investigated mainly in follow-up studies of the severely handicapped. In the future, more attention should be paid to the evaluation of adaptation.
4. The most common measure of outcome has been successful employment. Quickly finding work in the year following rehabilitation is the best indicator of long-term employment. The brevity of unemployment before rehabilitation is also a predictor of favorable outcome. The implications for the practice of rehabilitation are that problems should be tackled as early as possible, speedy preventive rehabilitation should be expanded, and the rehabilitation process should be condensed. This means that recommendations for preparatory vocational exercises should be carried out promptly and flexibly.
5. The reported success of comprehensive vocational rehabilitation varies: According to some studies, one-quarter of the subjects benefit from rehabilitation, while in other studies this proportion is even as high as two-thirds. Differences in the study designs make it difficult to compare them.

6. The subject's age and motivational factors were the most common and best predictors of rehabilitation outcome. The interrelationships among these variables, and issues such as the qualitative differences in motivation, have not been considered in these follow-up studies.

7. The outcome of rehabilitation depends on the subject's functional capacity. However, the severely handicapped are just as likely to achieve a successful outcome as the less severely handicapped. This indicates that psychological factors are crucial to the outcome of rehabilitation.

8. The follow-up studies do not usually take into account the unemployment rate. When it has been taken into account, its effects have proved to be difficult to evaluate. For the subjects, finding lasting employment depends inherently on employers' policies towards the handicapped (11). The links between employers and rehabilitation professionals should be strengthened.

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