

Rehabilitation in rural areas

A study to evaluate the effectiveness of a rehabilitation programme in a group of motor-disabled Vendas

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Curriculum vitae

Kees van den Broek has been working as a physiotherapist in Venda since 1981. He is married and has three children.

KEYWORDS: Handicapped;
Rehabilitation; Rural population;
Physical therapy

Summary

A field survey was conducted from the Siloam Hospital in Venda, to determine whether admission, physical training, home visits and follow-up encouragement resulted in improved activity performance of motor disabled people. The study showed a high rate of utilisation of orthopaedic appliances. It further showed significant differences between initial and final levels of functioning and indicated that rehabilitation of rural disabled people is a realistic objective.

Introduction

Disabilities which now limit the capabilities of people in the developing world are for the most part preventable. When impairment does occur, the absence of appropriate rehabilitation measures often results in increased disability and the development of social handicaps. The causes of severe impairment abound in the developing world. They affect the very populations most vulnerable and growing at the fastest rates, particularly the very young and the very poor. Developing nations thus confront a dilemma; they have to meet the challenge of the highest rate of disability in the world with the least available resources. They must plan to reduce a problem which is of a scope and severity that would test the capacity of even the most highly developed society (Hammerman 1982)¹.

In August 1981 a Dutch physiotherapist, Mr C.J. van den Broek, was appointed at the Siloam Hospital in Venda, and a new service was developed. Within a year this service extended into rehabilitation for the locomotor-disabled, not only for the Siloam area but also for the other two health wards in Venda; the Donald Fraser and Tshilidzini Hospitals. After a three-year-period a study was suggested to evaluate the effectiveness of the rehabilitation services.

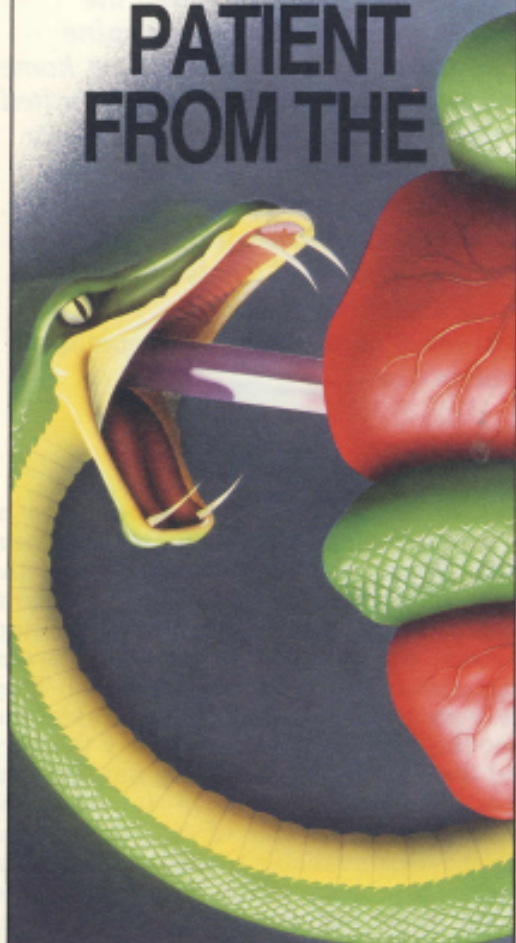
The Siloam Hospital was started in 1940 and the present population served by this hospital is more than 160 000, roughly one third of the total Venda



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Rehabilitation in Venda

population. Most of the Venda people live in rural or semi-rural surroundings and only a minority still have a traditional life-style. The majority has been influenced by the Western life-style. Most rural communities have limited or no rehabilitation services. Patients either travel hundreds of kilometres to rehabilitation centres or they go without. Unfortunately the latter outcome frequently results in permanent institutionalisation and long-term disability.

The problem of measuring impairment and disability in a rural area is compounded by the lack of standardised prevalence studies on morbidity and disability in rural areas, as well as by the confusion relating to the definitions of impairment, disability and handicap. (McLaren, Gear and Irwing 1986)². Fortunately an International Classification of Impairment Disability and Handicap has recently been published by the World Health Organisation (WHO, 1980)³ and the definitions of this classification were used in the design of this study.

Using an average prevalence figure of 4-7% for all degrees of physical impairment and 1,8% for severe disability in developing countries (WHO, 1981)⁴, one can calculate that there are 9000 (nine thousand) seriously disabled people in Venda (estimated population of 500 000).

People living in a rural area easily adapt to minor disabilities - and just live with it!

Field survey

The rehabilitation service which was established at Siloam Hospital in 1981 was evaluated by means of a field survey conducted in Venda. All locomotor-disabled adults and children who had been rehabilitated during 1983 and who had received an orthopaedic appliance were followed up at home.

Two questionnaires (for adults and children) were designed to obtain information about the use of the appliances, the problems experienced by the individuals with their disabilities, and the level of functioning in the period before and after the rehabilitation treatment.

The study aimed to determine whether admission, physical training, home visits and follow-up encouragement resulted in improved activity performance of motor disabled individuals.

The study showed a high rate of utilisation of orthopaedic appliances for both adults (91%) and children (92%). It further showed highly significant differences between final and initial levels of functioning for nearly all variables used in the study.

Rehabilitation

Rehabilitation is usually defined as the third phase in medicine, after prevention and curative care.

In 1981 a WHO⁴ expert committee recommended the use of the following definition for rehabilitation:

"Rehabilitation includes all measures aimed at reducing the impact of disabling and handicapping conditions, and at enabling the disabled and the handicapped to achieve social integration. Rehabilitation aims not only at training disabled and handicapped persons to adapt to their environment, but also at intervening in their immediate environment and society as a whole, in order to facilitate their social integration. The disabled and handicapped themselves, their families and the communities they live in should be involved in the planning and implementation of services related to rehabilitation."

A rehabilitation programme for a rural area needs a different approach to programmes for urban areas

The present structure of rehabilitation services in Southern Africa is institution-based rehabilitation (IBR) and is concentrated in the cities.

All rehabilitation professionals e.g. physiotherapists, occupational therapists and speech therapists are trained for first-world situations and are not equipped to deal with problems encountered in rural areas. It is evident that the conventional division into impairment categories e.g. physical, deaf, blind, mental retardation etc, is not appropriate in rural areas and that a multi-disciplinary approach is required.

COMMUNITY-BASED REHABILITATION

Community-based rehabilitation (CBR) is a concept closely related to primary health care and forms an integral part of the programme to develop health for all by the year 2000. "CBR involves measures taken at the community level to use and build on the resources of the community, including the impaired, disabled and handicapped persons themselves, their families and their community as a whole."

The CBR has been tested in different parts of the world. Menon (1984)⁵ reported on the use of the WHO manual "Training the Disabled in the Community" among a rural population in India. He mentioned that 55% (32 out of 58) of the cases studied showed obvious improvement in their overall functioning, as judged by their family members. He added that none of the cases included in the study would have received any institutionalised rehabilitated services if it were not for the programme.

REHABILITATION IN VENDA

In Venda we chose the following rehabilitation approach:

1. **Assessment** of the disabled persons was done individually based and focussed on the expectations of the person and the functional improvement of his physical impairment.
2. **Hospitalisation.** During admission in which the disabled person was rehabilitated (including physical training, sometimes surgery and prescription of an appliance) - the patient was made familiar with his aid. The central issue was the process of motivating the patient. The training, home visits, etc. were done by physiotherapy assistants, under supervision of the physiotherapist. In Venda there are well-trained physiotherapy assistants and they play a vital role in the Venda rehabilitation service.
3. The more severely disabled patients were **visited at home** prior to discharge. Circumstances were investigated and adjustments were suggested e.g. removal of steps, levelling of floors, widening of doors, construction of pavements etc. The appliances were then issued provided the adjustments had been carried out (family involvement).
4. A **private welfare organisation** was established to finance and manage several employment projects, a legal aid service for injury on duty, for car accident victims, and for the financing of the home adjustments, mentioned previously.

Developing nations have to meet the challenge of the highest rate of disability in the world, with the least available resources

Study methods

1. BROAD OBJECTIVE

To evaluate the effectiveness of the rendered rehabilitation service in a group of motor disabled individuals who all received physiotherapy and an orthopaedic appliance (and in some cases orthopaedic surgery or other medical care).

2. HYPOTHESIS

That the rehabilitation treatment which has been offered is positively and significantly associated with improved activity performance in disabled persons.

3. SAMPLE SIZE AND SELECTION

The study populations was selected from the impaired motordisabled, who were rehabilitated at Siloam Hospital.

The sample consisted of 138 consecutive motor disabled persons who were rehabilitated at the physiotherapy department between 1 January and 31 December 1983, and who had received an orthopaedic appliance. This period was chosen

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Category A: 3.1 Antirheumatics (anti-inflammatory agents).

Pharmacological action:

Meclomen is a non-steroidal agent which has demonstrated anti-inflammatory, analgesic, and antipyretic properties. The mode of action, like other non-steroidal, anti-inflammatory agents, is not known.

However, the drug inhibits prostaglandin synthesis, which may be responsible for the anti-inflammatory action of Meclomen.

Indications:

Meclomen is indicated for the relief of the signs and symptoms of rheumatoid arthritis and osteoarthritis, both in acute flare-ups and in the long-term management of these diseases.

Meclomen is also indicated for ankylosing spondylitis and acute musculoskeletal disorders such as bursitis, tendinitis, synovitis, tenosynovitis, capsulitis of the shoulder, sprains and strains. Studies in children to-date have been inadequate to evaluate the safety and effectiveness of Meclomen in this age group.

Contra-indications:

Meclomen should not be used in patients who have previously exhibited intolerance to it.

In children:

Meclomen is contra-indicated in children 14 years of age and under.

In pregnancy:

Meclomen is contra-indicated in pregnant women and nursing mothers.

In patients with gastrointestinal problems:

Meclomen should not be given to patients with active gastrointestinal lesions.

In allergic patients:

Acute allergic reactions have been reported.

Because the potential exists for cross-sensitivity to aspirin or other non-steroidal anti-inflammatory drugs due to structural relationships, Meclomen should not be given to patients in whom these drugs induce symptoms of bronchospasm, allergic rhinitis, or urticaria.

Dosage and directions for use:

Usual dosage:

The dosage is one 100mg capsule administered three or four times per day. After a satisfactory response has been achieved, the patient's dosage should be reviewed and adjusted as required. A lower daily dosage may suffice for long-term administration. If gastrointestinal complaints such as nausea, vomiting and gastro-intestinal bleeding occur, therapy should be terminated.

Side-effects and special precautions:

Side-effects:

Digestive system:

The most frequent adverse reactions occurring with Meclomen are gastrointestinal, i.e. diarrhoea, nausea and vomiting and abdominal pain, anorexia, heartburn, flatulence and constipation.

Dermatologic system:

Urticaria, erythematous maculopapular rashes, pruritus and Steven Johnson's syndrome have been

reported.

Haematologic system:

Granulocytopenia, thrombocytopenia, agranulocytosis, and autoimmune haemolytic anaemia have been reported.

Nervous system:

Dizziness, tinnitus and headache may occur.

Other systems:

Oedema, malaise, fatigue, myalgia and nocturia have occurred.

Precautions:

Meclomen should be given under close supervision to patients with a history of upper gastrointestinal tract disease. Peptic ulceration and gastrointestinal bleeding, sometimes severe, have been reported in patients receiving Meclomen.

Gastrointestinal irritation, abdominal pain, or diarrhoea may be associated with Meclomen therapy. Dosage reduction or temporarily stopping the drug has generally controlled the condition (see "Side-effects and special precautions" and "Dosage and directions for use" sections).

Patients with low haemoglobin values who are receiving long-term Meclomen therapy should have haemoglobin values determined as appropriate.

In patients receiving concomitant steroid therapy, any reduction in steroid dosage should be gradual to avoid the possible complications of sudden steroid withdrawal. Ophthalmic examinations performed prior to and following extended Meclomen use have not shown drug-related changes. However, because of adverse eye findings in animal studies with some other non-steroidal anti-inflammatory drugs, ophthalmologic studies should be carried out within a reasonable period of time after starting chronic Meclomen therapy and at periodic intervals thereafter.

Meclomen enhances the effect of hydantoins, coumarin anticoagulants and highly protein bound sulphonamides. When Meclomen is given to a patient receiving a coumarin anticoagulant, the dosage of the anticoagulant should be reduced to prevent excessive prolongation of the prothrombin time.

Known symptoms of overdosage and particulars of its treatment:

No specific information is available on the management of acute, massive overdosage with Meclomen. Should accidental overdosage occur, the stomach should be emptied by inducing emesis or by careful gastric lavage. Vital functions should be monitored and supported.

Identification:

Hard gelatin capsules with beige opaque body and light orange opaque cap.

Presentation:

As capsules, each containing sodium meclofenamate monohydrate equivalent to 100mg meclofenamic acid in containers of 100.

Storage instructions:

Store in a cool (15°C to 25°C), dry place out of reach of children. Protect from light.

because the rehabilitation programme was well established at this time and the study population would have stayed at home for at least 6 months after their rehabilitation treatment.

The issuing of an appliance, a special inclusion criteria, made the study group homogeneous and comparable. It was a well documented group and because of the proportionally high budget and costs of resources, we wanted to see if these individuals were using their appliances properly. We could also compare their initial and final level of functioning.

MEASURING INSTRUMENT

Two questionnaires (one for adults and one for children under 12 years) were developed, based mainly on the ICIDH guide (WHO, 1980)³. The questionnaires were designed to measure the degree of disability including mobility problems, and handicaps experienced by the individuals in the socio-economic sphere. The scoring of the disability and the handicap were based on the WHO scoring categories - modified from the ICIDH guide. (Figure 1) The questionnaires also measured the problems experienced by the individuals with their orthopaedic appliance.

Most questions were of the closed type, and all cases were individually interviewed.

In this study a **Self-help** group was defined as a group of adults or children with an interval range less than two on the scale. A **Need-help** group was defined as a group of adults or children with an interval range greater than two on the severity scale. This group depended on other persons for their daily activities.

VARIABLES

For the purpose of this study the following variables were defined, based on the WHO monograph No 12 (Wood and Badley, 1981)⁶, and adapted for rural Venda.

- | | |
|-----------------------------|--|
| 1. <i>Personal care</i> | including hygiene, dressing and going to toilet. |
| 2. <i>Locomotor</i> | including standing up from a lying position and sitting, walking and traversing through rough terrain. |
| 3. <i>Body disposition</i> | including shopping, collecting water, wood and food from the field, cooking and laundry. |
| 4. <i>Social function</i> | including travelling, use of public transport, visiting neighbours and attending school, church and tribal meetings. |
| 5. <i>Economic function</i> | including (self) employment, pension and any other support. |

viewers. A number of participants were at rest/sleeping or doing sitting work/household duties.

A number of activities are apparently done without the use of the appliance. The failures were partly related to the condition of the appliances - e.g. broken, ill-fitting, causing pain/sores. Eighteen per cent (18%) of the adults and 21% of the children reported the aid to be in bad condition. It was amazing to see how people could cope with totally worn-out appliances. Contributing factors in this regard are long distances, the perseverance of some rural people who are used to poverty, hardship and suffering and an insufficient budget for these appliances. The results further showed that failures were found mainly in the elderly group and amongst those who had had polio and received a below-knee calliper. It seems that people living in a rural area adapt easily to "minor" disabilities, especially those who used to walk barefoot and who were handicapped for a long period. Fifty per cent (50%) of the adults were not rehabilitated for more

Figure 1: Severity scale categories (modified from the ICIDH)

0 : <i>not disabled</i>	i.e. the individual can perform the activity unaided and on his own in a normal manner and without difficulty.
1 : <i>difficulty in performance</i>	i.e. the individual can perform the activity unaided and on his own, but only with difficulty.
2 : <i>assisted performance</i>	the need for a helping hand, i.e. the individual can perform the activity whether augmented by aids or not, only with some assistance from another person.
4 : <i>complete inability</i>	i.e. the activity is impossible to achieve.
5 : <i>not applicable</i>	i.e. severity grading not applicable to particular disability.

Results and findings

The overall response rate was 89,9% (87,6% adults, 95,1% children). Most participants were found in the younger age groups. More than 60% of the study population was younger than 25 years. Polio (42%) and congenital cases (21%) were mostly found amongst younger age groups, while amputees (45%) were more frequently seen in the elderly group. The study showed high utilisation rates. On arrival 68% of the adults and 56% of the children were wearing the appliances. The everyday utilisation rate was much higher: 91% in adults and 92% in children.

The difference between these rates is thought to be caused by the arbitrary time of arrival of the inter-

Unfortunately rehabilitation is not regarded as a priority in developing countries - and private support needs to be found

than 10 years after developing their disability. This teaches us to be careful in prescribing appliances when it is not of real functional importance - in the opinion of the person concerned - as well as in elderly age groups.

Compared with other studies we saw high utilisation percentages. In a Cape Town study⁷ conducted in 1981 only one-third of the children up to 12 years used the most commonly ordered appliances properly.

A multi-disciplinary as well as a multi-disability approach is needed

Second part of survey

We compared and evaluated the differences between final and initial level of functioning in 61 adults and 33 children. The remaining 24 adults and 6 children of the total study population had received immediate treatment after they became disabled and could therefore not be compared with the others. The McNemar Test for Symmetry (McNemar Chi Square) showed highly significant differences on almost all variables under study. See Tables 1 and 2 combined.

Table 1: *Level of functioning differences (61 adults) between before/after treatment*

	Self-help before		Self-help after		Need-help before		Need-help after	
	Number	%	Number	%	Number	%	Number	%
Personal care								
Hygiene/dressing	61	100	61	100	0	0	0	0
Going to toilet	44	72	58	95	17	28	3	5
Locomotor								
Standing, lying, sitting	44	72	55	90	17	28	6	10
Walking	42	69	55	90	19	31	6	10
Traversing	32	52	40	66	29	48	21	34
Body disposition								
Shopping	38	62	52	85	23	38	9	15
Collecting water	8	13	10	16	53	87	51	84

Table 2: *Level of functioning differences (33 children) between before/after treatment*

	Self-help				Need-help			
	before		after		before		after	
	Number	%	Number	%	Number	%	Number	%
Going to toilet	14	42	31	94	19	58	2	6
Walking	13	39	31	94	20	61	2	6
Playing outside	17	52	31	94	16	48	2	6

Personal care

All participants maintained an effective independent existence in regard to the more basic physical needs including feeding, personal hygiene and dressing.

Locomotor

More complex activities such as going to the toilet and walking, showed remarkable improvement. For walking ability, 13 of the 19 Need-help adults moved into the Self-help group (McNemar 13 p0,0003). In children, 18 of the 20 Need-help moved into the Self-help group (McNemar 13 p0,0001).

The terrain in Venda often requires a considerable amount of traversing ability from patients in order to be able to move around effectively. In many places the terrain is mountainous and stony. In rough areas 32 adults remained in Self-help, 21 adults remained in the Need-help while 8 adults moved from Need-help to Self-help (McNemar 8, p0,0047). Comparable results were seen for the body disposition qualities collecting wood, food and water.

The study showed that the rehabilitation treatment was functional and mainly concentrated on the basic activities of daily living. It also showed that 34% of the adults remained severely restricted with regard to collecting wood and water, which is a particularly serious handicap for the female population in rural Venda. In children the "playing outside the yard" was regarded as another key accomplishment. Fourteen (14) of the sixteen (16) Need-help group moved to the Self-help, while 17 remained in the Self-help group (McNemar 14, p 0,0002). The importance for children in this respect is obvious.

Social

After the rehabilitation treatment, 95% of the adults could participate satisfactorily in social life and 31% of the adults improved in this respect. In children there was a similar significant improvement. The rehabilitation treatment has a profound effect on school-going behaviour in the younger age groups. In children (0-12 years) 92% attended school after the rehabilitation. Of the entire school-age

group (36 children, 23 adolescents) 66% attended school before and 87% attended school after the rehabilitation treatment.

Employment

Before the rehabilitation only 13% had a job of whom 8% lost their work due to the impairment. After the rehabilitation treatment 20% of the adults under study qualified for the first employment project which was established next to the hospital area.

Pension

The recommendation for a disability pension was another priority in our rehabilitation programme. We can report that all who qualified were granted a disability pension: a compliment to the Department of Welfare and Pensions in Venda! This percentage is remarkably high compared with other rural areas. McLaren (1984)⁷ reported in a prevalence study in rural KwaZulu that 12% of all the disabled who qualified for a disability grant, did in fact receive such grants!

Rural people living in rough surroundings go on coping amazingly well with their totally worn-out appliances!

Conclusions and recommendations

As primary health care and vaccination policies in Venda begin to have their effect, we can expect the nature of the physically handicapped population to change. This means that the polio group will diminish greatly, whilst the cerebral palsy group will probably stay constant. This will not reduce the need for rehabilitation services, but will require considerable expertise and funds in order to successfully rehabilitate a more severely handicapped population.

The WHO visualises a pyramidal system of referral services, at secondary and tertiary level, providing trained manpower and increasingly sophisticated technology to those disabled people who would need access to more than the elementary services at community level.

The rehabilitation services in Venda went through different stages. It became obvious that a mere technical hospital-rehabilitation was insufficient to meet the needs of the disabled people. To train a severely disabled person (e.g. to walk) might seem to be successful within the hospital premises, but back at home, this training might not be beneficial at all. Therefore the rehabilitation approach was changed and an after-care system developed. Home visits and the provision of home adjustments became a priority. At a later stage we discovered the need of an employment project as well as legal

aid facilities for the injured at work, and car accident victims.

Like in other developing countries, rehabilitation in Venda is not regarded as a priority. Therefore a private welfare organisation was established to assist in rehabilitation where the hospital services were insufficient.

Rural Vendas have to travel far for rehabilitation facilities, or go without

This involved:

- the provision of a transport system for after care
- capital investments for employment projects
- home adjustments and legal aid facilities
- salaries for full-time field workers.

This private welfare organisation was able to raise enough funds from abroad to finance all these aspects of community-based rehabilitation.

Taking into consideration the WHO strategy of CBR from grassroots level to sophisticated centres we recommend the following for the development of rehabilitation services in other rural areas:

1. The availability of a hospital or centre with a rehabilitation department, including a number of rehabilitation beds.
2. The creation of posts for rehabilitation workers in the hospital and the clinics in order to assist in proper after care and follow-up. A multi-disciplinary approach as well as a multi-disability approach is needed. In this concept of community based rehabilitation (CBR) the rehabilitation workers (locally-trained people) play a vital role.
3. The financing of after-care projects by establishing private welfare organisations.

Rehabilitating the disabled in a rural area is extremely rewarding

4. It is recommended that the rehabilitation methodology be standardised taking into consideration the experience already gained. Treatment protocols could be of great help in understaffed work situations. A strategy should be worked out in consultation with those people working with the disabled in rural areas as well as with the disabled themselves in order to integrate different experiences for a strategy in rural areas.

We suggest that this study be repeated after 5 years in order to confirm the important message which emerged from it, namely that:

"Rehabilitation of the rural disabled people is a realistic objective"

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Drop in ischaemic heart mortality

DEPARTMENT OF NATIONAL HEALTH AND POPULATION

Correspondence to: Dr H Küstner, Private Bag X63, Pretoria 0001.

Epidemiological Comments Dec 1986; 13: 1

Deaths from ischaemic heart disease are a major contributing cause of mortality in SA whites. Data are presented in some detail to illustrate the mortality experience of this group for the period 1968 to 1983.

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Reference: Brühl, P., et al. *Dtsch. Med. Wschr.* 104 (1979): 1236.

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