

Community Based Rehabilitation Program for People with Musculoskeletal Conditions

Andrea Polovina¹, Ana Bobinac-Georgievski², Mirka Jakšić³, Tajana Polovina-Prološćić⁴ and Simeon Grazio¹

¹ University Department of Rheumatology, Physical Medicine and Rehabilitation, University Hospital »Sestre milosrdnice«, Zagreb, Croatia

² Department of Physical Medicine and Rehabilitation, Hamad Medical Corporation, Doha, Qatar

³ Department of Physical Medicine and Rehabilitation, General Hospital »Sveti Duh«, Zagreb, Croatia

⁴ Department of Physical Medicine and Rehabilitation, University Hospital »Osijek«, Osijek, Croatia

ABSTRACT

Community based rehabilitation program in people with musculoskeletal conditions was evaluated using Dartmouth COOP Functional Health Assessment Charts/WONCA (COOP/WONCA charts). The program consisted of educative and training protocol in a primary healthcare setting. It had two parts, both with six visits, in the first part three times a week and in the second part once a week. Clients with musculoskeletal conditions (N=204) were included if they agreed to take active part in the rehabilitation process. The first part of the program was completed by 77 clients, and complete program by 52 subjects. Positive changes on the COOP/WONCA charts were achieved by more than 50% of the subjects that completed the program, in all categories but Social Activities. The program proved effective in terms of short-term evaluation with COOP/WONCA charts in those that complete the program. The high dropout rate and long-term efficiency have yet to be investigated.

Key words: community based rehabilitation, musculoskeletal conditions, COOP/WONCA charts

Introduction

Musculoskeletal conditions have a great impact on the society, healthcare system and individuals since they are a common cause of long-lasting pain and limitation of physical ability. Therefore, the 2001–2010 has been proclaimed the Bone and Joint Decade¹. Disorders of the musculoskeletal system are known to be the most common reason for sick leave².

In Croatia, musculoskeletal disorders are the third most common reason for the people older than 65 to visit their physician³. The need of rehabilitation has been on a continuous increase; visits to physiatrist offices increased by 117% from 2000 to 2003⁴. The community based rehabilitation (CBR) project was launched to find a new rehabilitation approach that would create a bridge between local community and specialized institutions where most of these problems were generally dealt with, an approach that would be close and familiar to patients on the one hand, satisfying their needs, and simple and less expensive to the society on the other hand. By definition, CBR is a strategy within community development for the

rehabilitation, equalization of opportunities, and social integration of all people with disabilities. According to the United Nation concept, CBR is implemented through joint efforts of the people with disabilities themselves, their families and communities, together with the appropriate health, educational, vocational and social services⁵.

In Croatia, CBR as a service model was developed by Sveti Duh General Hospital as a special primary healthcare unit at Trnje Health Center in Zagreb⁶. It started working in 1996 supported by authorities from both institutions, the City of Zagreb, Croatian government and with significant support of two international organizations, World Health Organization (WHO) and Canadian International Development Agency (CIDA) through International Centre for the Advancement of Community Based Rehabilitation (ICACBR)⁷. Its location at primary healthcare level was intended to facilitate direct contact with local community through collaboration with primary healthcare physicians, nurses and local social wel-

fare office. The CBR team included specialty experts such as physiatrists, physiotherapists, occupational therapists, junior researchers, and users representative as a peer counsellor, in addition to primary healthcare nurse, social worker, volunteers and, if needed, other members from local community.

The CBR practice offers various interventions for and with people with disabilities to facilitate their functioning and health within their own environment. The CBR treatment may include use of physical modalities, but individual therapies differ from classic physical therapy. The basic characteristic of CBR practice is active patient participation while minimizing all forms of passive therapy. To reflect the active role of the individual requiring rehabilitation, the term client is preferred to the terms patient or disabled person. There was also an attempt to create a situation in which the client receives all the necessary information, education, help, support and encouragement in order to play a more active role and to function better at home, at work, and in the community.

The majority of CBR clients visiting Zagreb CBR unit were people with musculoskeletal conditions (80%), mostly spine disorders. In order to meet their rehabilitation needs in a CBR way, a special program named 6+6 program was developed.

The purpose of the study was to evaluate functional outcome of the CBR program in people with musculoskeletal conditions.

Materials and Methods

The 6+6 program was developed for patients with musculoskeletal conditions. The program included mainly education of medical exercise and self-help methods, with a few, if any, passive procedures such as ultrasound or electrotherapeutic procedures. The medical exercise program consisted of five parts: warming up, stretching, specific exercises according to a particular problem, cardiovascular conditioning, and relaxation. Emphasis was put on educating clients how to perform exercise by themselves at home.

The program consisted of two parts, both with six visits to the facility. On each visit clients worked in groups led by a physiotherapist or one of the clients, supervised by a medical expert. For the first six visits in the first part of the program, clients came three times weekly to CBR unit to acquire due knowledge, training and skills, primarily related to exercises and self-help methods. In the second part of the program, they were asked to apply the techniques at home and to visit CBR unit only once a week, for six successive weeks. They were given time to acquire the healthy habit of regular exercise at home and an opportunity to correct the mistakes that may have arisen while exercising alone, without expert supervision.

CBR clients were assigned to the 6+6 program by a physiatrist or junior researcher if suffering from a musculoskeletal condition related to spinal disorder or joint disease that resulted in limitation of activities of daily

living, irrespective of its duration, if they required therapy, and if they agreed to take an active part in the rehabilitation process. Clients with acute inflammatory conditions, unregulated hypertension or cardiac problems and clients who could not tolerate exercise or those who wanted mainly electrotherapeutic procedures were not included.

A total of 204 clients were included in the program; 52 of them finished the complete program (group A). Group B included clients that quit during the second part of the program, having only completed the first part (n=77). Group C consisted of clients that quit during the first part of the program (n=75).

Dartmouth COOP Functional Health Assessment Charts/WONCA (COOP/WONCA charts), a popular instrument for the measurement of functional status in primary care, were used on outcome measurement. The charts were first developed by Nelson *et al.* and later modified by the Classification Committee of the World Organization of National Colleges, Academies and the Academic Association of General Practitioners/Family Physicians (WONCA)^{8,9}.

The charts provide an instrument that is covering a core set of seven functional and health aspects: physical fitness, social activities, feelings, pain, changes in health, daily activities, and overall health. For each category there is a multi-choice question to be answered by one of the given answers. Answers are scored from one to five. Each numeric answer has a short textual description and illustration. No. 1 in each category indicates the best condition and No. 5 indicates the worst condition. The pain category is not obligatory according to the literature, but was retained reflecting its high significance because pain was present in all our clients¹⁰.

In the program, the COOP/WONCA charts were answered on three occasions: first prior to starting the program as an initial assessment (A1), second at the end of the first part of the program (A2), and third at the end of the program to show the clients' final status (A3).

Outcome was assessed by comparing answers from the COOP/WONCA charts. Comparison was made for each of the seven categories of the COOP/WONCA charts. The possible outcome was designated as improvement, worsening or unchanged condition¹¹.

The first to second COOP/WONCA charts comparison was used to assess the outcome of the first part of the program (A2:A1), and the second to third COOP/WONCA charts comparison to assess the outcome of the second part of the program (A3:A2). The complete program outcome was estimated by comparing the baseline and final functional status (A3:A1).

Data of the same group in different time frames were analyzed by McNemar test for dependent samples, and data of different groups by χ^2 -test. Statistical significance of interaction between variables was tested by log-linear analysis except for the age variable, where Student's t-test was used. The level of significance was set at $p < 0.05$.

Results

Differences between the initial and final conditions and the impact of particular program segments are shown in Table 1. Upon completion of the program, the majority of clients showed improvement in almost all categories of the COOP/WONCA charts. The only exception was the category of Social Activities, where unchanged condition was reported by the majority of clients (Table 1).

Total improvement according to the COOP/WONCA charts in the group of clients that finished the program (n=52) ranged from 42.3% (Social Activities) to 71.2% (Daily Activities). The highest proportion of unfavorable change (worsening) was recorded in the category of Feelings (19.2%) and lowest in the category of Changes in Health (5.8%).

The highest proportion of unchanged condition was reported in the category of Social Activities (48.1%) and lowest in the category of Daily Activities (19.2%).

For most categories, improvement was greater in the first than in the second part of the program, with the exception of the Pain category. A statistically significant difference was only observed in the Change in Health category (p=0.001).

Worsening showed an opposite pattern to improvement. It was more often recorded in the second part of the program for all categories of the COOP/WONCA charts, however, without a statistically significant difference in any of the categories.

Comparison of the first and second parts of the program yielded a slightly higher rate of unchanged condition in four categories, equal in one and lower in two cat-

egories of the COOP/WONCA charts. The difference was particularly high in the category of Change in Health, where almost three times more clients observed no change in health in the second part of the program in comparison to the first part (23.1%:65.4%; p=0.001) (Table 2).

A great proportion (74.5%) of study clients did not complete the program. In order to determine the factors that influenced completion of the program, three groups were analyzed for demographic data (sex, age, work status, marital status, number of children), initial functional status, and simplified location of musculoskeletal problem (neck, low back, spine in general, arm, leg, and multiple locations). The only significance was found for the variables of age (p=0.004) and work status (p=0.023). The group of clients that quit before finishing the first part included more employed and unemployed individuals, whereas the group of clients that finished the program included more retired individuals. The significance of the variable of age matched the work status: group C included younger and group A older individuals.

The program effectiveness as a factor that influenced the completion of the program could only be determined in groups A and B. Comparison of the results obtained at the end of the first part of the program between these two groups is presented in Table 2. There were no statistically significant differences. However, in group B pain had already diminished in many clients in the first part of the program but there still were many clients who experienced more pain. There were also more clients who improved after the first part of the program in Overall Health, whereas in group A there were more clients

TABLE 1
CHANGES IN FUNCTIONAL STATUS OF PATIENTS THAT COMPLETED THE 6+6 PROGRAM (GROUP A, n=52), YIELDED BY COOP/WONCA CHARTS AND DEFINED AS IMPROVEMENT, WORSENING AND UNCHANGED CONDITION IN SPECIFIC CATEGORIES, ANALYZED IN COMPLETE PROGRAM, FIRST PART OF THE PROGRAM AND SECOND PART OF THE PROGRAM (IN PERCENTAGE)

Changes in functional status yielded by COOP/WONCA charts	Categories of COOP/WONCA charts						
	Physical fitness	Social activities	Feelings	Pain	Change in health	Daily activities	Overall health
Complete program							
Improvement	57.7	42.3	51.9	57.7	69.2	71.2	51.9
Worsening	11.5	9.6	19.2	7.7	5.8	9.6	9.6
Unchanged condition	30.8	48.1	28.9	34.6	25.0	19.2	38.5
First part of the program							
Improvement	50.0	48.1	44.2	36.5	71.1*	55.8	34.6
Worsening	13.5	15.4	13.5	7.7	5.8	11.5	9.6
Unchanged condition	36.5	36.5	42.*3	55.8	23.1	32.7*	55.8
Second part of the program							
Improvement	32.7	32.7	32.7	48.1	23.1*	40.4	32.7
Worsening	19.2	23.1	26.9	15.4	11.5	13.5	11.5
Unchanged condition	48.1	44.2	40.4	36.5	65.4	46.1*	55.8

COOP/WONCA charts – Dartmouth COOP Functional Health Assessment Charts/WONCA

*Significant on comparing first and second part of the program

TABLE 2

CHANGES IN FUNCTIONAL STATUS OF PATIENTS THAT COMPLETED THE 6+6 PROGRAM (GROUP A, n=52) AND PATIENTS THAT WITHDREW AFTER THE FIRST PART OF THE PROGRAM (GROUP B, n=77), YIELDED BY COOP/WONCA CHARTS AND DEFINED AS IMPROVEMENT, WORSENING AND UNCHANGED CONDITION IN SPECIFIC CATEGORIES, IN THE FIRST PART OF THE PROGRAM (IN PERCENTAGE)

Changes in functional status yielded by COOP/WONCA charts in the first part of the program	Categories of COOP/WONCA charts						
	Physical fitness	Social activities	Feelings	Pain	Change in health	Daily activities	Overall health
Patients that withdrew after the first part of the program (group B)							
Improvement	44.2	35.1	48.1	46.8	67.5	55.8	48.1
Worsening	11.6	16.8	9.1	11.6	6.5	14.3	10.4
Unchanged condition	44.2	48.1	42.8	41.6	26.0	29.9	41.5
Patients that completed the program (group A)							
Improvement	50.0	48.1	44.2	36.5	71.1	55.8	34.6
Worsening	13.5	15.4	13.5	7.7	5.8	11.5	9.6
Unchanged condition	36.5	36.5	42.3	55.8	23.1	32.7	55.8

COOP/WONCA charts – Dartmouth COOP Functional Health Assessment Charts/WONCA

whose Overall Health remained unchanged. The rate of improvement in Social Activities was higher in group B than in group A.

Discussion

Community based programs designed to encourage regular physical activity, behavior modification, and self-management have shown some success in improving health status and quality of life, and in reducing health care utilization. Holland *et al.* measured the effects of senior wellness program on health and social well-being. At 12 months, clients were engaged in significantly more stretching and aerobic exercise than the controls. Depressive symptoms decreased among those with moderate or higher symptom scores¹². Lorig *et al.* presented a similar program for people with chronic conditions, based on education and taught largely by peer-instructors from a highly structured manual. One year after exposure to the program, most patients experienced statistically significant improvements in a variety of health outcomes¹³. Community based exercise program for the elderly with free, twice weekly exercise class has shown to produce significant gains in health related quality of life, at the same time being cost effective¹⁴.

The 6+6 program was a newly developed CBR program practiced at a Zagreb health center and designed for people with musculoskeletal conditions. In spite of the waiting lists existing in most institutions, we tried to enable the clients to enter the program almost immediately. In our working conditions it meant up to 40 clients a day *per* therapist. At the same time, the program had to be designed according to the CBR guidelines, mostly emphasizing active participation. Also the costs were calculated, so we created a program that was less expensive according to the national insurance company price list due to the smaller number of procedures and group work. Most importantly, it had to have a favorable impact

on the client’s health, thus the study was so designed as to collect data to determine functional outcome and the impact that was actually achieved.

The main purpose of an outcome study is to gather and show data that can be used to compare the quality of services provided by health care organizations¹⁵. For a CBR program, evaluation is one of the basic postulates. Its importance is emphasized in the WHO guidelines for program evaluation¹⁶. However, these guidelines do not precisely define the data and questionnaires that should be used. The Commission of the Accreditation of Rehabilitation Facilities (CARF) defines evaluation as a systematic procedure to determine the effectiveness and efficiency of the accomplishment of results in clients after rehabilitation services¹⁷.

There is no »gold standard« or defined protocol to determine which questionnaires and criteria should be used. The researcher must often decide whether to measure several concepts in one questionnaire or to focus on one concept but measure it accurately¹⁸.

Although originally developed in primary practice, the COOP/WONCA charts are a generic instrument for measuring the patient’s functional status and are therefore appropriate in physical medicine and rehabilitation. One of the reasons they were chosen in this study is that in their concept, the COOP/WONCA charts relate in part to the International Classification of Impairments, Disabilities and Handicaps (ICIDH)¹⁹. Physical Fitness equals the disability level, Feelings equal the impairment level, and Daily and Social Activities equal the handicap level⁹. The development of ICF as a current classification progressed from the ICIDH. ICIDH has led to the assessment of a wider range of rehabilitation outcomes²⁰.

When deciding on the COOP/WONCA charts as a measuring instrument, we were aware that there would be few, if any, chance to compare the results. However, in 1997 we performed a pilot study to compare the effective-

ness of two different rehabilitation programs for patients with musculoskeletal impairments: CBR and institutional rehabilitation (used at Department of Physical Medicine and Rehabilitation, Sveti Duh General Hospital, Zagreb)²¹. The COOP/WONCA charts were used and judged as a good measuring instrument. In the literature, statistical analysis of data obtained by COOP/WONCA vary^{9,22–24}. Anders *et al.* have designated outcome as improvement, worsening or unchanged, and we used this method in the present study.

Improvement occurred in the majority of clients that completed the program in all but one category (Social Activities). Improvement in the category of Daily Activities was expected due to the character of the CBR program itself, mainly due to education in the methods of self-help and activities of daily living and psychological support. Although the same was expected in the category of Social Activities, it was rather infrequently recorded. It is possible that a longer period of time is necessary to lead to behavioral changes in this segment of life.

We did not expect the program to be given up by so many clients. Data analysis showed only the work status and age to have a significant impact on program completion. Younger, employed (both working and on sick-leave) and unemployed people tended to quit the program earlier, whereas retired people showed a higher tendency to finish it.

REFERENCES

1. Bone and Joint Decade's Musculoskeletal portal. Available from: <http://www.boneandjointdecade.org>, accessed January 3, 2007. — 2. TORSTENSEN TA, LJUNGGREN AE, MEEN HD, ODLAND E, MO-WINCKEL P, GEIJERSTAM SA, *Spine*, 23 (1998) 2616. — 3. STEVANOVIĆ R, Osobe starije životne dobi u ordinacijama opće/obiteljske medicine u 2003 godini. In: BAKLAIĆ Ž (Ed), *Zdravstveno stanje i zdravstvena zaštita pučanstva starije životne dobi u Republici Hrvatskoj* [in Croatian] (Croatian National Institute for Public Health, Zagreb, 2005). — 4. STEVANOVIĆ R, PRISTAŠ I, Osobe starije životne dobi u specijalističko konzilijarnoj zaštiti u 2003 godini. In: BAKLAIĆ Ž (Ed), *Zdravstveno stanje i zdravstvena zaštita pučanstva starije životne dobi u Republici Hrvatskoj* (Croatian National Institute for Public Health, Zagreb, 2005). — 5. WHO, *Community based rehabilitation for and with people with disabilities* (J.P.P. of ILO, UNESCO, WHO, 1994). — 6. BOBINAC-GEORGIEVSKI A, *Int J Rehabil Res*, 23 (2000) 1. — 7. PEAT M, *Community based rehabilitation* (WB Saunders Co. Ltd., London, 1997). — 8. LAM CLK, LAUDER IJ, LAM DTP, *Fam Pract* 16 (1999) 184. — 9. WEEL CV, *Disabil Rehabil*, 15 (1993) 96. — 10. PETERS TJ, COAST J, RICHARDS SH, GUNNELL DJ, *Epidemiol Community Health*, 52 (1998) 59. — 11. ANDERS E, TEMME M, RADERSCHAFT B, SZECSENYI J, SANDHOLZER H, MICHAEL MK, *Br J Gen Pract*, 45 (1995) 661. — 12. HOLLAND SK, GREENBERG J, TIDWELL L,

There is a growing interest in self-management programs that emphasize the central role of patients in managing their illness. The efficiency of these programs has yet to be demonstrated, which was the goal of the present study. In conclusion, the complete 6+6 program proved to be efficient in people with musculoskeletal problems. However, the dropout rate and long-term efficiency need to be thoroughly investigated.

Acknowledgements

The study was supported by the Ministry of Science through the Effectiveness of Community Based Rehabilitation Project No. 129009, approved and supported by the Ministry of Science of Republic of Croatia in the 1996–2000 period. Development of CBR in Croatia was initiated by the WHO project Regional Model for Physical Rehabilitation 1996–1998. The Canadian International Development Agency, Centre for the Advancement of Community Based Rehabilitation at Queen's University in Kingston, Ontario support the Croatian-Canadian Project Development of Community Based Rehabilitation in Croatia. The City of Zagreb (Office for Health, Labor and Social Welfare) and Ministry of Defense offered financial support to CBR initiatives.

Thanks to all members of CBR team from the WHO, IC CBR Canada and RUZ Zagreb, Trnje Health Center.

MALONE J, MULLAN J, NEWCOMER R, *J Aging Health*, 17 (2005) 697. — 13. LORIG KR, SOBEL DS, RITTER PL, LAURENT D, HOBBS M, *Eff Clin Prac*, 4 (2001) 256. — 14. MUNRO JF, NICHOLL JP, BRAZIER JE, DAVEY R, COCHRANE T, *J Epidemiol Community Health*, 58 (2004) 1004. — 15. OSBORN CE, *J Rehabil Outcomes Meas*, 2 (1998) 18. — 16. WHO, *Guidelines for conducting, monitoring and self assessment of CBR programmes: using evaluation information to improve programmes* (WHO, International Disability Consortium, WHO/RHB/96.3, Geneva, 1996). — 17. GONNELLA C, FLETCHER GF, *Rehabilitation Medicine Contemporary Clinical Perspective* (Lea & Febiger, Philadelphia, London, 1992). — 18. KOPEC JA, ESDALE JM, *Spine*, 20 (1995) 1943. — 19. WHO, *International Classification of Impairments, Disabilities and Handicaps (ICIDH)* (WHO, 1980). — 20. POST MW, DE WITTE LP, SCHLJVERS AJ, *Clin Rehabil*, 13 (1999) 5. — 21. BOBINAC GEORGIEVSKI A, JAKSIC M, POLOVINA A, KATUSIC M, *Disabil Rehabil, Suppl* 1, 22 (2000) S18. — 22. HARVEY U, NELSON SJ, LYONS RA, UNWIN C, MONAGHAN S, PETERS TJ, *Br J Gen Pract*, 48 (1998) 1043. — 23. WESTBURY RC, ROGERS TB, BRIGGS TE, ALLISON DJ, GERVASJ, SHIGEMOTO H, ELFORD W, *Fam Pract*, 14 (1997) 178. — 24. BRUUSGAARD D, NESSIOY I, RUTLE O, FURUSETH K, NATVIR G, *Fam Pract*, 10 (1993) 212.

A. Polovina

University Department of Rheumatology, Physical Medicine and Rehabilitation, University Hospital »Sestre milosrdnice«, Vinogradska cesta 29, 10000 Zagreb, Croatia
e-mail: saan@vip.hr

PROGRAM REHABILITACIJE U ZAJEDNICI U OSOBA S MIŠIĆNO KOŠTANIM TEGOBAMA

S A Ž E T A K

Funkcijski ishod programa rehabilitacije u zajednici u osoba s mišićno-koštanim tegobama evaluiran je koristeći Dartmouth COOP Functional Health Assessment tablice/WONCA (COOP/WONCA tablice). Program se sastojao od protokola edukacije i vježbanja na nivou primarne zdravstvene skrbi. Imao je dva dijela, obadva sa šest dolazaka, u prvom dijelu tri puta tjedno, u drugom jednom tjedno. Uključivani su klijenti s mišićno koštanim stanjima (N=204) ako su pristajali preuzeti aktivnu ulogu u rehabilitacijskom procesu. Prvi dio programa završilo je 77 klijenata, a cjelokupni program 52. Pozitivne promjene na COOP/WONCA tablicama postignute su u više od 50% osoba koje su završile program, u svim kategorijama osim Socijalnim aktivnostima. Prema COO/WONCA tablicama program se pokazao kratkoročno učinkovitim u osoba koji program završe. Veliki broj odustalih i dugoročna učinkovitost se trebaju ispitati.