

RESEARCH PAPER

Increasing physical activity in patients with arthritis: a tailored health promotion program

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Objective: Despite recent studies showing the benefit of physical activity for people with arthritis, the vast majority of persons with arthritis are not sufficiently physically active. The purpose of this report is to describe a tailored health promotion intervention aimed at increasing physical activity among persons with arthritis. The intervention is designed to be useful for health systems and insurers interested in a chronic disease management program that could be disseminated to large populations of arthritis patients.

Methods: The intervention is carried out by a clinician who is designated as the client's physical activity advocate. The approach emphasizes motivational interviewing, individualized goal setting, tailored strategies for increasing physical activity and for monitoring progress, and a plan of 2 years of follow-up. The intervention includes a standardized assessment of barriers to and strengths supporting increased lifestyle physical activity. A randomized, controlled trial is underway to evaluate the efficacy and cost-effectiveness of this intervention.

Conclusion: This intervention is unique in that it implements a program tailored to the individual that focuses on lifestyle physical activity and long-term monitoring. The approach recognizes that persons with arthritis present with varying levels of motivation for change in physical activity and that behavior change can take a long time to become habitual.

Keywords: Arthritis, Behavior change, Intervention, Motivational interviewing, Physical activity

INTRODUCTION

Despite evidence accumulated over more than 20 years that physical activity can maintain joint health, prevent disability, reduce pain, and improve function,¹ the proportion of the United States population with arthritis that engages in the amount of physical activity recommended by the Centers for Disease Control and Prevention and the American Academy of Sports Medicine (CDC/AASM) is only around 24%.² Based on data collected

from the Behavioral Risk Factor Surveillance System, more than 60% of those with doctor-diagnosed arthritis do not meet Centers for Disease Control and Prevention (CDC) recommended guidelines, and 24% of persons with arthritis are classified as inactive, reporting virtually no moderate intensity physical activity.³ The reasons for this inactivity are numerous, but the list includes the inability or reluctance of physicians to promote physical activity during office visits and the reluctance of people with arthritis to engage in formal exercise programs, a commonly prescribed type of physical activity.

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Physicians, having little training in health promotion, infrequently ask clients about their physical activity and often report feeling unprepared to prescribe physical activity as part of the treatment plan.⁴⁻⁶ When asked about counseling to begin or continue physical activity, only 34% of clients reported being counseled at their last visit.⁴ In the 1998 National Health Interview Survey, only 50% of older adults who attended a routine check-up reported being asked about their physical activity by healthcare providers.⁶

Another barrier to increasing physical activity behavior among those with arthritis is the reluctance to 'exercise'. Exercise programs are defined as a subset of physical activity that is 'planned, structured, and repetitive, with the intent of improving or maintaining one or more facets of physical fitness or function'.⁷ Lifestyle physical activity – routine activity that is part of everyday life such as cleaning, laundry, and gardening⁸ – can be as beneficial as planned exercise in promoting the health of the person with arthritis and may be more acceptable than 'formal exercise' to persons with arthritis.

Although there are several exercise programs designed for people with arthritis (such as Arthritis Foundation programs for both land and water-based exercise), in general exercise programs are designed for able-bodied persons and may be difficult for many people with arthritis due to damage in and around joints, pain, fatigue, and functional limitations that commonly occur as part of the disease process. Both physical limitations to activity and motivation to change the current level of physical activity vary from individual to individual. Interventions that take into account both a person's physical and motivational readiness have been demonstrated to be superior for those individuals who are struggling to increase their level of physical activity.⁹

This report presents an individualized intervention, carried out by a health professional (a nurse or occupational therapist), to promote physical activity, especially lifestyle

activity, in persons with arthritis. We report here on the Improving Motivation for Physical Activity in Arthritis Clinical Trial (IMPAACT) Physical Activity Promotion Program. The primary goal of this tailored intervention is to have each client increase his or her level of physical activity. Current guidelines for persons with osteoarthritis from the United States Department of Health and Human Services recommend at least 150 min per week of moderate-intensity physical activity performed in episodes of at least 10 min. These guidelines are equivalent to those for both adults and older adults. In addition, the guidelines recommend that persons with chronic disabilities that cannot reach this target should engage in physical activity according to their abilities and avoid being physically inactive.¹⁰ Consequently, clients in the IMPAACT program are encouraged to set goals to increase their activity relative to their current starting point. As they achieve these goals, they are encouraged to set new goals for greater physical activity. The effectiveness of the IMPAACT intervention is currently being evaluated in a randomized controlled trial.

CONCEPTUAL FRAMEWORK OF THE IMPAACT PHYSICAL ACTIVITY PROMOTION PROGRAM

The IMPAACT intervention utilizes the client-centered, directive approach of motivational interviewing (MI)¹¹ in addition to concepts of decisional control, affective support, and habit formation. These concepts are described in more detail below. The intervention focuses on increasing lifestyle physical activity rather than formal exercise. The Cox Interaction Model of Client Health Behavior (IMCHB) informs the comprehensive approach.¹² The strength of the IMCHB lies in its emphasis on the relationship between individual client characteristics, which provides the basis for understanding a person's health behavior,

and the features of provider behaviors that influence client health outcomes. The model assumes that clients are not passive recipients of information, but active agents who have both the desire, and the ability, to make informed decisions regarding their health behavior and healthcare.¹²

The key IMCHB concepts consistent with the Physical Activity Promotion Program are decisional control and affective support (Fig. 1). *Decisional control* refers to ‘the process of creating a healthcare climate that is supportive of autonomy rather than controlling’ (p. E95).¹³ Because the model focuses on decisional control, it is ideally suited to situations that call for the client’s personal responsibility and control in the health promotion effort. In the IMPAACT intervention this involves encouraging clients to be active in determining the type and

extent of physical activity they would like to perform. *Affective support* describes ‘the process of attending to a client’s level of emotional arousal and building an affiliative bond with the client’ (p. E95).¹³ In the intervention this involves the physical activity advocate (a healthcare provider, such as a nurse or occupational therapist) actively asking about the client’s experiences with arthritis and emotional concerns regarding physical activity. Together affective support and decisional control allow for collaboration in goal setting and treatment planning. The clinician can use these concepts to facilitate the client’s readiness to change by matching the clinician’s responses to the client’s situation. The client and a physical activity advocate collaboratively develop a plan through which the client can increase physical activity. The plan might be as simple

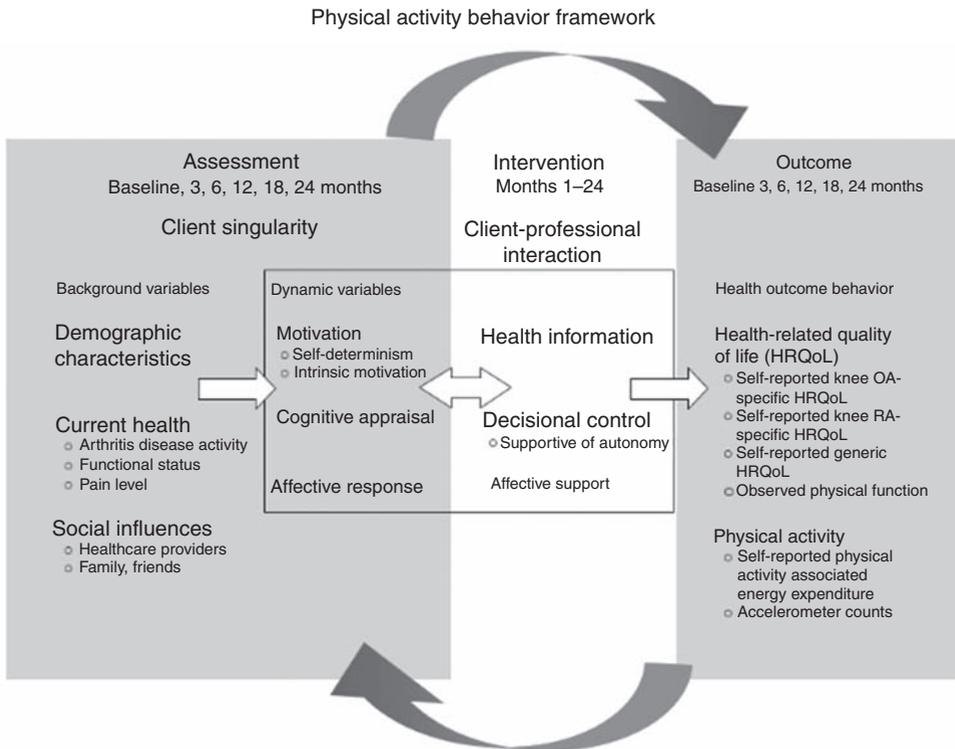


FIG. 1. Physical activity behavior framework based on the Interaction Model of Client Health Behavior (IMCHB) revised 2003. From “A Model of Health Behavior to Guide Studies of Childhood Cancer Survivors,” by C.L. Cox, 2003, *Oncology Nursing Forum*, 30(5), p. E93. Copyright 2003 by the Oncology Nursing Society. Adapted with permission.

as the client allowing the physical activity advocate to call in a week if the client is uncertain about change or as extensive as a client who faxes a weekly record of their physical activity to the advocate at the end of each week.

Behavior change occurs with repetition, over time. By providing supportive intervention at regular intervals over a 2-year period, clients have an extended opportunity to replace previously sedentary habits with increased activity.¹⁴ Allowing clients to include personally valued activities, such as those associated with lifestyle physical activity, means clients are personally invested in the activities they are doing to increase their activity level.¹⁵

DESCRIPTION OF THE INTERVENTION

The IMPAACT physical activity promotion program (Table 1) consists of 6 components, in part based on work by Cimprich:¹⁶ identifying supports and barriers to physical activity using the Arthritis Comprehensive Treatment Assessment (ACTA); identifying goals for change; developing a mutually agreed upon action plan; establishing an agreement in writing to increase physical

activity; developing a strategy for recording progress; and planning for future encounters with the physical activity advocate.

THEMES OF THE TAILORED INTERVENTION: MOTIVATIONAL INTERVIEWING AND BEHAVIORAL TECHNIQUES

Client motivation and readiness for change are explored and directed during meetings between the advocate and the client using motivational interviewing (MI). MI is the predominant approach in the initial interview; however, the advocate applies MI principles in all interactions with participants. MI is an approach for helping individuals to resolve their ambivalence about changing their behavior. MI emphasizes that motivation to change comes from the client and not the health professional. The client/advocate relationship is viewed as a partnership rather than expert/recipient roles. It is the client's job to resolve his or her own ambivalence regarding change. Resistance to change is viewed as a function of the interaction between the client, the advocate, and life circumstances.

The four basic clinical principles of MI are: expressing empathy, developing

TABLE 1. Overview of the intervention

Study activity	Baseline	Follow-up visits
		3, 6, 12, 18, and 24 months
Participant meets with a physical activity advocate (face-to-face baseline/ phone at follow-up).	X	X
Discusses facilitators and barriers to being physically active (completes the ACTA).	X	
Completes brief review interview (modified ACTA).		X
Sets goals and action plan.	X	X
Sets strategies to monitor progress (pedometer and steps calendar).	X	X
Encourages strategies to monitor progress.	X	X
Physical activity pyramid.	X	

discrepancy, rolling with resistance, and supporting self-efficacy.¹¹ Empathy is expressed through reflective listening. The advocate provides a sense of understanding and support by carefully listening and reflecting back to the client the perceived meaning of their comments. Developing discrepancy between the client's goals and current behavior helps the individual identify issues surrounding the desire to make a change in behavior. Rather than challenging or confronting the client, which can lead to more resistance to change, the advocate 'rolls with' the client's resistance to change, allowing the client to make the choices that they desire (Table 2). Finally, supporting self-efficacy provides the client with a sense of decisional control and confidence about truly being able to make a change in behavior. A comprehensive discussion of the use of MI in healthcare can be found in Rollnick *et al.*¹⁷

Using an MI approach, the goal of the advocate is to help the client begin change talk – the verbalization of the intention to change. Change talk can take the form of statements of desire, ability, reasons for change, need, commitment, actually taking steps or action for change.¹⁷ Change talk is incorporated into the goals and action plan that the client formulates with the advocate.

MI has been shown to be an effective approach for promoting behavior change in persons with HIV risk behaviors¹⁸ and increases in physical activity in long-term cancer survivors.¹⁹

In addition to MI, the IMPAACT intervention incorporates several evidence-based behavioral approaches for promoting increased physical activity. Goal setting can be effective because it provides participants with achievable targets for behavior change. Goal setting has also been associated with improvements in physical activity.^{20–22} Evidence also suggests that the use of a pedometer is associated with a significant increase in physical activity.^{23,24} Because self-monitoring and performance feedback are well-validated techniques to create habitual behaviors, we offer a pedometer and step calendar to treatment group participants on which to record their daily step counts and their thoughts about physical activity.²⁵

ASSESSMENT USING THE ACTA

The advocate begins the intervention with a face-to-face meeting with the client. The initial interview is guided by The Arthritis Comprehensive Treatment

TABLE 2. *Standard approach v. motivational interviewing example*

Standard approach	Motivational interviewing	Comments
As your healthcare professional, I really think that you should exercise on a daily basis.	What are your thoughts about exercising?	Focus is on client's concerns.
There are all kinds of ways you could exercise. You could walk, ride a bike, swim or go to a gym.	What kinds of activities do you enjoy?	Egalitarian partnership.
You say that you don't have time to exercise, but exercise is so important for your joints, you should make time for it.	You say that time is a barrier for you to exercise, what ideas do you have to fit physical activity into your daily routine?	Focus is on client's concerns. Match intervention to client's level of motivation.
I've written some goals for you about increasing your exercise.	Tell me what you would like to work on for the next three months.	Emphasis is on client personal choice. Goals are set collaboratively.
You say you want to be more active, yet you don't do the home exercise program I gave you. This tells me that you just are not interested.	Your ambivalence about exercise is normal. Tell me how you would like to move forward.	Ambivalence is a normal part of the change process.

Assessment (ACTA), a systematic assessment of factors that support or interfere with an individual becoming more physically active. It consists of a semi-structured interview, a rating scale, goal setting and expression of commitment. Information from this assessment informs both the advocate and the client about what to focus on in the tailored referral and counseling intervention. The interview covers seven areas of interest including: client perception of the research study roles and responsibilities, daily routine, life roles, environment and social

support, impact of arthritis on daily life, physical activity, and future view. The interview provides both the client and advocate an opportunity to explore the factors the client sees as most relevant to his or her current level of physical activity.

After the interview, the advocate and client collaboratively score the ACTA rating scale. The ACTA rating scale consists of 23 statements that address disease status, functional status, lifestyle, and incentives for activity (Fig. 2). The items and rating scale used in the ACTA were initially developed by focus

Arthritis comprehensive treatment assessment (ACTA)				
Client: _____	Date: _____			
Advocate: _____				
Mark the number that best describes how this item affects your physical activity	0	1	2	3
Health-related supports & barriers				
1. Balance: <i>Feeling like you might fall over</i>	0	1	2	3
2. Pain: <i>Soreness in your joints or muscles</i>	0	1	2	3
3. Fatigue: <i>Feeling tired or washed out</i>	0	1	2	3
4. Mood: <i>Feeling happy, sad, or blue</i>	0	1	2	3
5. Other illnesses: <i>Other illnesses that limit your physical activity</i>	0	1	2	3
6. Flexibility/range of motion: <i>Being able to bend & move your joints easily</i>	0	1	2	3
7. Walking: <i>How far and/or how fast you walk</i>	0	1	2	3
Personal supports & barriers				
8. History of activity: <i>How active you have been in the past</i>	0	1	2	3
9. Exercise/sports: <i>Doing formal exercise like water aerobics, golf, tennis</i>	0	1	2	3
10. Fear of falling/injury: <i>Being worried you will fall/get hurt if you are active</i>	0	1	2	3
11. Knowledge: <i>Knowing how much activity you should get per day</i>	0	1	2	3
12. Enjoyment: <i>The pleasure (or not) that you get from being physically active</i>	0	1	2	3
13. Opportunity: <i>Your usual work/leisure/IADLs include moderate intensity</i>	0	1	2	3
14. Body image: <i>The way you think your body looks affects (or not) your activity</i>	0	1	2	3
15. Routine/demands: <i>How busy your day is with things you have to get done</i>	0	1	2	3
16. Competence: <i>Your belief in your physical abilities</i>	0	1	2	3
17. Motivation: <i>Your desire to be more active</i>	0	1	2	3
Environmental supports & barriers				
18. Social support: <i>Getting encouragement (or not) from friends/family</i>	0	1	2	3
19. Personal resources: <i>Having the space, time, equipment you need</i>	0	1	2	3
20. Local resources: <i>Sidewalks, malls, gym, park, pools in your neighborhood</i>	0	1	2	3
21. Safety: <i>Being able to use your neighborhood safely for activity</i>	0	1	2	3
22. Substance use: <i>Smoking or alcohol</i>	0	1	2	3
23. Other: <i>Anything else that helps or gets in the way of you being more active</i>	0	1	2	3

FIG. 2. Arthritis comprehensive treatment assessment rating scale.

groups that included persons with arthritis, physicians, nurses, and other healthcare providers. Items were refined with participant feedback through several pilot studies. The content of the statements is consistent with the International Classification of Functioning, Disability and Health (ICF) dimensions of impairments, activities, and participation. Each statement represents a potential support or barrier to participation in lifestyle physical activities. The ACTA is based upon a family of other instruments that were formulated to improve clinical decision-making.²⁶

The 0 to 3 scale that is used to rate each statement in the ACTA rating scale is designed to reflect the need for change such as no action needed (0), watchful waiting (1), action needed (2), and action needed immediately (3). As such, the ACTA rating scale clearly points out where the person's participation in physical activities would be facilitated by working with an existing strength or eliminating a barrier. This can help the client and advocate in developing a plan for change.

The interview integrates an MI approach. Open-ended questions stimulate clients to provide information about their current routine and interests in physical activity. Affirmations regarding current physical activity and desire for change help to establish a positive relationship between the client and the advocate. Reflective listening provides an opportunity for the advocate to further explore issues identified by the client and shows the client the advocate's attention and understanding of their explanations. Summarization allows the advocate to clarify ideas identified by the client and move the conversation towards change.

GOALS SETTING, ACTION PLAN, WRITTEN AGREEMENT, MONITORING PROGRESS, AND FOLLOW-UP

After completing the ACTA, the client works with the advocate to identify and select goals that he/she personally finds motivating.

In line with the 2008 US Department of Health and Human Services Physical Activity Guidelines 150 min of moderate intensity physical activity act as a guideline for goal setting while recognizing that this level is not achievable by all participants.¹⁰ Collaboratively, the client and advocate negotiate the strategies that will be needed to help clients achieve their self-identified goals by developing an individualized action plan. The advocate helps a client problem solve and organize their thoughts about how to establish goals that are realistic and achievable. The client is then offered the opportunity to sign an agreement that they are committed to increasing their physical activity. Because the advocate and client meet only quarterly and then biannually, a plan is formulated which identifies potential strategies the client can pursue, should he/she have difficulty meeting these goals. This plan could include more frequent communication with the advocate by phone, email, fax, text message, or in person and may include reporting of activities attempted, encouragement and affirmation of activity or imparting of information if requested by the client.

The advocate also offers the client strategies to consider for monitoring progress in physical activity. Strategies include a pedometer (steps counter) and monthly calendars on which to record daily step totals. The steps calendar also provides the client an opportunity to record comments that influenced activity on a particular day. This information can guide the client and advocate in modifying activity for greater success. Clients are also offered an activity pyramid with lifestyle physical activity suggestions to stimulate ideas about ways to be more active.²⁷ The lifestyle physical activity pyramid gives examples of activities in the categories of light physical activity, light-moderate physical activity, heavy-moderate physical activity and vigorous physical activity. Through pilot studies we have determined that the initial interview takes approximately one hour with follow-up

interviews lasting anywhere from 15–30 min, depending on the client's needs.

Follow-up to the initial intervention occurs at 3, 6, 12, 18, and 24 months. A follow-up meeting begins with a review of the past goals and action plan. A modified (shortened) ACTA interview is completed to understand issues or changes in supports and barriers to physical activity since the last interview. If needed, new goals and action plans are developed collaboratively at each follow-up session. Affirmations of achievements of any degree or even self-reflection on inability to achieve previously set goals supports the client to move forward in setting new goals to increase physical activity. Plans for further communication are identified as needed. Although the baseline interview is conducted face-to-face, clients can choose whether follow-up occurs in person, by telephone, email, text messaging, or fax. Currently, the method of follow-up is being evaluated and whether the method of follow-up influences adherence to the program. A user manual for the program, including the ACTA interview and rating scale along with other resources is currently available upon request.

TREATMENT FIDELITY

Treatment fidelity refers to procedures formulated to ensure that the intervention is implemented as intended: in this case core motivational interviewing principles are implemented in a consistent fashion by all advocates, while topical coverage is tailored to the clients' specific strengths and barriers.²⁸ Advocates receive training in MI techniques by watching training tapes, attending workshops and having a videotaped session reviewed by a consultant from the Motivational Interviewing Network of Trainers. Advocates also receive training in the specific content of the IMPAACT intervention by observing and then delivering the intervention under direct observation by an experienced advocate.

DISCUSSION

Previous studies of physical activity promotion in arthritis focused on brief, standardized interventions highlighting formal exercise.^{29,30} The IMPAACT intervention is unique among published research studies in the arthritis and rehabilitation literature in that it addresses lifestyle physical activity rather than exercise, incorporates motivational interviewing techniques, and has a contact strategy over a period of 2 years. The intervention approach reflects the premises that persons with arthritis present with varying levels of motivation to change physical activity and that behavior change can take many months to become habitual. Motivational interviewing and evidence-based behavioral techniques are utilized by healthcare professionals to assist clients with arthritis achieve mutually agreed upon physical activity goals. The intervention takes place in a therapeutic setting similar to that utilized in disease management programs, the client's physician endorses the increase in physical activity behavior, but the advocate-client interactions take place outside of the physician office visit setting.

The IMPAACT intervention is currently being evaluated through an NIH-funded randomized, controlled trial in clients with rheumatoid arthritis (RA) or knee osteoarthritis (OA). The primary outcome measures are pain and function as measured by the Health Assessment Questionnaire³¹ for subjects with RA, the Western Ontario and McMaster Osteoarthritis scale³² for subjects with knee OA, and the SF-36³³ for all subjects. The design of the trial takes into consideration the long-term nature of the intervention by monitoring progress for 2 years. The trial design also recognizes the importance of physician support for physical activity. Both treatment and control participants in the trial receive physician counseling that reinforces the CDC/AASM recommendations for physical activity. Treatment subjects receive the IMPAACT intervention in addition to physician counseling. Control subjects receive 'usual care' in

addition to physician counseling. We believe that the effectiveness of the IMPAACT intervention will be maximized if physicians consistently support the goals of the intervention. Our pilot study work looked at the ability to engage in physical activity and the usefulness of identifying supports and barriers to participation, goal setting, and feedback via pedometers, but not adherence to a physical activity program. The current trial will look at the issue of adherence and effectiveness of the program.

Cost-effectiveness studies are also in progress, which should determine the feasibility of disseminating the IMPAACT intervention. If the intervention proves to be effective and cost-effective, it could be incorporated into disease management programs to reach large populations of patients with arthritis. Furthermore, if the IMPAACT intervention proves to be effective in arthritis patients, the approach is likely to be generalizable to persons who have other chronic conditions with or without joint-related barriers (e.g. pain and decreased range of motion).

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