
**THE OSTEOPOROSIS PREVENTION AND
SELF-MANAGEMENT PROGRAM**

PROGRAM EVALUATION

REPORT TO

**SENIORS INDEPENDENCE PROGRAM
HEALTH CANADA**

January 1997

**IHPR
Institute of Health Promotion Research
University of British Columbia
Vancouver, BC Canada**

**OSTOP, Osteoporosis Society of BC
Vancouver, BC**

Funding for this project was made available through a grant from the Seniors Independence Program, Health Canada.

THE OSTEOPOROSIS PREVENTION AND
SELF-MANAGEMENT PROGRAM

PROGRAM EVALUATION

REPORT TO

SENIORS INDEPENDENCE PROGRAM
HEALTH CANADA

Report Prepared by Patrick McGowan, Ph.D.,
Honorary Research Associate
Institute of Health Promotion Research
University of British Columbia

January 1977



EXECUTIVE SUMMARY

This report describes results of four separate studies carried out to evaluate the impact of the Osteoporosis Prevention and Self-Management Program (OPSMP). The osteoporosis program was funded as a demonstration project in British Columbia for a two-year period by the Seniors Independence Program of Health Canada. The program was based on similar successful self-management programs used to assist people with arthritis, first in B.C. and later across Canada. The evaluation of OPSMP was a collaborative effort of OSTOP, The Osteoporosis Society of B.C., represented by a 15-member advisory committee, and of investigators from the Institute of Health Promotion at the University of British Columbia.

The objectives assessed in the evaluation were:

- * There will be a greater awareness of osteoporosis among health care professionals and generally in the female population.
- * OPSMP participants will have greater confidence in their ability to practice a healthier lifestyle, and/or to manage their osteoporosis.
- * OPSMP participants will make positive behavioural and lifestyle changes.
- * OPSMP participants will feel less pain, perceive themselves to be in better health and feel that their quality of life has been improved.

These objectives were evaluated through four, separate studies, using both quantitative and qualitative research methods and based on principles of Participatory Research.

The evaluation showed that the OPSMP was highly successful in increasing awareness about osteoporosis and in introducing participants to knowledge about osteoporosis and to the concepts of self-management. The result is that, following such a program, at-risk populations will take preventive action and those with osteoporosis will adopt behaviours that helps them manage the condition and reduce the morbidity.

Program process was deemed to be both feasible and viable in that over the two-year period, 217 persons were trained to lead the program and 68 courses were delivered to 835 persons in 46 community settings.

The evaluation showed: awareness about osteoporosis did increase, particularly among participants in the study; OPSMP was highly successful in introducing participants to new knowledge about osteoporosis and to concepts of self-management; OPSMP participants did

exhibit greater confidence in their abilities to practice healthier lifestyles and to manage their osteoporosis; and, following the program, participants perceived themselves to be in better health and thought their quality of life improved. Brief overviews of the study results related to six important outcomes are given in detail in the concluding section (Section V) of the report.

Three recommendations arise out of the project:

1. That the program continue to be offered to the general population.
2. That the OPSMP course be re-designed to focus on two populations -- people without osteoporosis, and people with osteoporosis.
3. That the OPSMP also be targeted to young adults, especially adolescent women.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	i
TABLE OF CONTENTS	iii
LIST OF TABLES	v
PROJECT ADVISORY COMMITTEE	vi
PROJECT RESEARCH TEAM	vii
INTRODUCTION AND BACKGROUND	1
THE OSTEOPOROSIS PREVENTION AND SELF-MANAGEMENT PROGRAM	2
Course Content and Process	3
Project Objectives	4
Process Objectives	5
Intermediate Objectives	6
Long Term Objectives	6
OPSMP IMPLEMENTATION	7
OPSMP EVALUATION	10
Study 1 - Awareness and Importance of Osteoporosis Among Health Professionals ..	11
Methodology	11
Results	12
Study 2 - Impact Study	13
Methodology	13
Results	14
Exercise Behaviours	15
Dietary Intake	18
Osteoporosis Self-Efficacy	18
Results	21
Health Beliefs about Osteoporosis	22
Pain Level, Perceived Health Status and Quality of Life	24
Additional Participant Feedback	27

Study 3 - Participants' Opinions Regarding the Benefits of OPSMP	31
Methodology	31
Results	31
Study 4 - Follow-Up Telephone Survey of OPSMP Participants	34
PROJECT DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS	36
Awareness of Osteoporosis	37
Exercise and Dietary Behaviours	38
Self-Efficacy	39
Health Beliefs	39
Pain, Perceived Health Status and Quality of Life	40
Additional Participant Feedback	40
Group Process and Support Groups	40
Recommendations	41
Conclusion	41
REFERENCES	42
APPENDICES	43
Appendix A Leader's Manual	
Appendix B Participant's Handbook	
Appendix C UBC Ethical Approval	
Appendix D Survey of Continuing Care Personnel in BC Health Units	
Appendix E Consent Forms and Evaluation Questionnaires	
Appendix F Qualitative Interview Questions	
Appendix G Results of Qualitative Interviews	
Appendix H Telephone Survey of Participants	

LIST OF TABLES

Table 1.	Methods of Focusing Interventions to Enhance Elements of Social Cognitive Theory	3
Table 2.	OPSMP Project Objectives	4
Table 3.	Location of Leader Training Workshops and Number of Graduates	7
Table 4.	OPSMP Class Locations and Number of Participants	8
Table 5.	Profile of the 189 OPSMP Participants Who Completed Pre- and Post-Program Questionnaires	14
Table 6.	Pre- and Post-Program Significant Levels of Changes in Exercises for Total Sample, Osteoporosis Group, and Group without Osteoporosis	16
Table 7.	Frequencies of Participants in Each of the Five Categories of Exercise	17
Table 8.	Pre- and Post-Program Significant Levels of Changes in Dietary Products for Total Sample, Osteoporosis Group, and Group without Osteoporosis	18
Table 9.	Statistical Significance Levels of Changes in Scores of Self-Efficacy Questions from Pre-Program to Six Months	21
Table 10.	Significance Levels of Change Scores of the Five Subscales of the Osteoporosis Health Belief Scale (n=122)	24
Table 11.	Pre- and Post-Program Changes on Pain, Quality of Life, and Perceived Health Scores for the 189 OPSMP Participants	26

LIST OF FIGURES

Figure 1.	Social Learning Theory: Components and Processes	19
Figure 2.	Health Belief Model	23

PROJECT ADVISORY COMMITTEE

A 15-member Advisory Committee was established to assist with program implementation and evaluation. Committee members were the following:

Rita Bakan	Lynne Maxwell
Mary Brown	Patrick McGowan
David Bryn-Jones	Helen Niskala
Beverly Burnside	Gail Pitney
Sandra Cumming	Norma J. Smith, Chair
Betty Darling	Mish Vadasz
Shirley Dunbar	Nora White
Chris Lovato	

The Advisory Committee meetings were held monthly during the two-year project. Terms of Reference for the Advisory Committee were finalized in December of 1994.

Terms of Reference

Preamble

The function of the Committee will be to provide input, interpretations, guidance, and suggestions on the activities that will be carried out during the project from the perspective of individuals who have a personal or professional interest in osteoporosis.

Duties - Program

1. To suggest ways which information about the project (OPSMP) can be disseminated to seniors, the public-at-large, and health care professionals.
2. To suggest ways of finding volunteers who will take the Osteoporosis Prevention and Self-Management Program leader training course.
3. To provide guidance to the coordinator(s) regarding form, content, and style of promotional activity.
4. To assist with public relations and promotional activity when appropriate.
5. To assist the Project Director prepare the Final Report.
6. To critique the questions and scales that will be used in the Key Informant Survey and Pre- and Post-program Questionnaires, and suggest modification or alternates.
7. To suggest individuals who could serve as key informants in the Key Informant Survey which will take place at the beginning and at the end of the project.
8. To assist the selected leaders by providing comment and suggestions on the proposed interview guide for the open-ended questions for the qualitative research activity that will be conducted during year two.
9. To review and offer interpretation on the information obtained in the surveys, the pre- and post-test questionnaires and the interviews.

PROJECT RESEARCH TEAM

Investigators

Patrick McGowan, Ph.D.

Lawrence W. Green, Dr.P.H.

Research Assistants

Sherry Lynch, B.A., B.S.W.

Mimi Doyle-Waters, B.S.W., M.A.

Terry Findlay, BSc., B.A.

Patricia MacFarlane, B.A., B.S.W.

Statistical Consultation

Jonathan Berkowitz, Ph.D.

Bob Uttl, Ph.D.

Interviewers

Cecily Isler

Anna Cruz

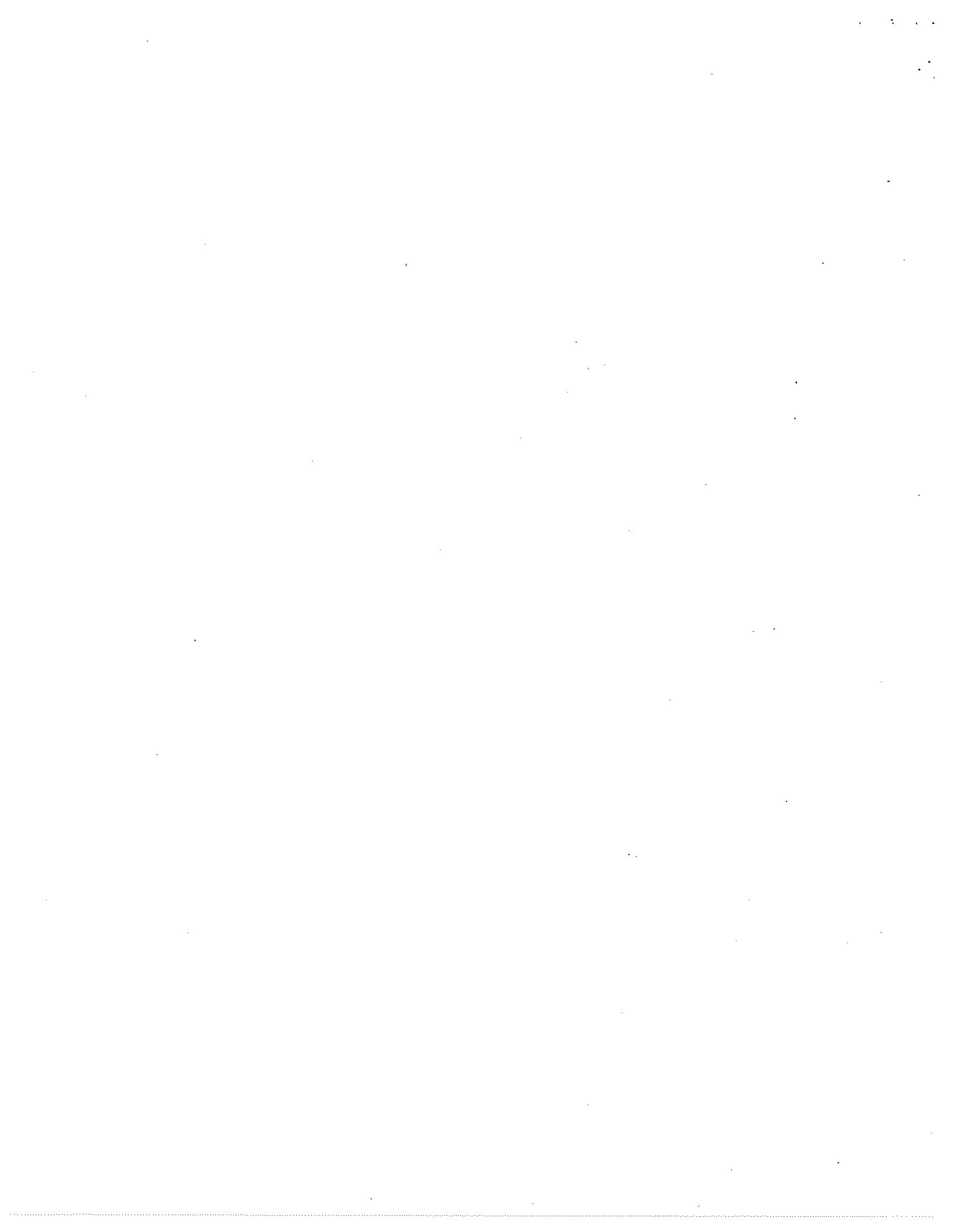
Faye Redston

Mimi Doyle-Waters

Secretarial Services

Lisa Richardson

Wendy Klein



THE OSTEOPOROSIS PREVENTION AND SELF-MANAGEMENT PROGRAM

REPORT TO SENIORS INDEPENDENCE PROGRAM, HEALTH CANADA

I. INTRODUCTION AND BACKGROUND

In 1994, OSTOP, The Osteoporosis Society of British Columbia received funding from the Seniors Independence Program, Health Canada, for a demonstration project to introduce and implement an Osteoporosis Prevention and Self-management Program (OPSMP) throughout British Columbia. The program was based on a Osteoporosis Prevention and Self-Management Program developed in 1990 in Australia and on similar successful programs on self-management of arthritis that had been implemented in British Columbia and Canada in the early 1990s.

This report provides some background to the project and describes the results of the evaluation of the program.

The Demonstration Project used the Osteoporosis Prevention and Self-Management Program developed and tested in Victoria, Australia. This program is described in Section II of this report. The demonstration project was conducted in 46 community settings in British Columbia. Over a two-year period, 217 individuals received a four-session course to become volunteer leaders; these volunteer leaders then provided 68 community-based courses to 835 individuals interested in preventing osteoporosis or in managing their osteoporosis condition.

A 15-member advisory committee (see page viii) drew up the terms of reference and provided guidance with program implementation and evaluation, as described in Section III.

A project research team (see page ix) carried out the evaluation, based on principles of participatory research. This evaluation of the demonstration program, as described in Section IV, was carried out through four separate research studies, using both quantitative and qualitative methods. Study 1 used pre-program and post-program survey questionnaires to determine the awareness and importance of osteoporosis among health care professionals. Study 2 used pre-program and post-program questionnaires for OPSMP participants to determine what impact, if any, the program had on the participants. Program objectives related to osteoporosis awareness, exercise behaviours, diet, osteoporosis knowledge, health beliefs, pain, perceived health status, and quality of life were used as a base for the information to be elicited. Study 3 used qualitative research techniques to provide in-depth responses related to program objectives and to benefits or short-comings of the program; OPSMP participants took part in a modified nominal group meeting and in interviews to determine effects of the program. Study 4 used a telephone survey and questionnaire technique to gain specific

information about behavioural changes as a result of the program.

Discussion and summary of the findings of the studies is provided in Section V. Also included in this section are three recommendations that repeatedly came from participants during the research studies.

II. THE OSTEOPOROSIS PREVENTION AND SELF-MANAGEMENT PROGRAM

The Osteoporosis Prevention and Self-Management Program (OPSMP) was developed in the spring of 1990 by the Arthritis Foundation of Victoria, Australia. The model and framework of the program was based on the Arthritis Self-Management Program (ASMP). OPSMP was developed to promote health education about osteoporosis. The aim is to reduce the incidence of this preventable disease and improve the management of existing osteoporosis in the community.

In OPSMP, a four-session course is led to groups of persons (between 10 and 15) by two trained volunteers. The volunteer leaders receive a two-day training given by either the Program Coordinator or by a designated trainer. The Program Coordinator travels to the volunteers' community and gives the leader training workshop to groups of 6 to 20 persons, depending on the size and location of the community. During the two-day leader training workshop the volunteers learn how to use the "Leaders Manual" (Appendix A), which contains standardized content and methods used in the course. At the end of the two-day leader training workshop the volunteers must be able to demonstrate that they follow the methods and processes that were taught.

The experience of other programs that train leaders to deliver education programs has shown that between 50% and 60% of the volunteers who take the training go on to lead courses. Those who do not go on to lead the courses cite reasons such as worsening health, a change in either the home, family, or work situation, or perceived inability to lead the course. However, this group has been extremely supportive in the other "behind the scenes" activity in arranging and delivering courses.

Volunteers who complete the leader training workshop are awarded a certificate by the OSTOP Society, indicating they have successfully completed the training program and are qualified to lead the course.

The next step of the process is the volunteers deciding when and where to give the course in their own communities. Usually the course is delivered in public areas such as

seniors centres, or recreation centres. Volunteer leaders decide with whom they will deliver the course (i.e., their partner), decide on a date and location, and advertise the course to potential participants through the existing methods within that community. Community newspapers, bulletin boards, word of mouth, and flyers have been productive in advertising the program.

When this is accomplished the volunteers inform the Program Coordinator of the plans. The coordinator then sends the required number of Participants Handbooks (Appendix B) to the volunteers. Each participant receives a personal copy of the Participants Handbook. They bring this book to each course as a reference and they are encouraged to read specified sections for each class. A nominal fee is charged to each participant to register in the course. The registration fees are used to cover the costs of the Participants Handbooks, costs associated with using the facility, and coffee and cookies, and costs to cover any out-of-pocket expenses incurred by the volunteers who are leading the course. Interested people who are unable pay the registration fee receive a scholarship to attend the course.

Course Content and Process

The Osteoporosis Course content includes information on basic bone anatomy, pathology of osteoporosis, risk factors, appropriate exercise and calcium intake regimens, hormone replacement therapy, medical treatments for established osteoporosis, bone density measurement, falls prevention, and effective communication with doctors and health care professionals.

In the course, an interactive, experiential environment is promoted, and through a variety of educational and behavioural strategies participants learn self-management strategies. Through these strategies participants gain a greater sense of confidence in their ability to manage the activities needed to either prevent or deal with their health condition. The self-efficacy enhancing strategies used in the course are shown in Table 1. These include: use of role models to lead the course; participants making contracts and providing feedback and problem-solving; reinterpretation of physiological signs and symptoms; and use of group processes to promote vicarious experiences. Course leaders learn to use these processes during their two-day leader training workshop.

This program, which has been tested and validated, was adopted for use in the demonstration project in B.C.

Table 1

Methods of Focusing Interventions to Enhance Elements of Social Cognitive Theory

ELEMENTS	PROGRAM STRATEGIES
Performance Accomplishments	Personal experience - skills mastery Mastery experiences Contracting and concurrent feedback
Vicarious Experience	Group members help each other in problem-solving Modelling perseverant successes Group work
Social Persuasion	Group work Contracting (short-term goals) Structuring success situations
Physiological State	Reinterpretation of physiological signs and symptoms, (e.g., fatigue) Stress management (relaxation techniques)
Appraisal of Efficacy Information	Efficacy validation Dealing with preconceptions Credibility of others

Project Objectives

The Osteoporosis Prevention and Self-Management program was developed to promote health education on osteoporosis. The goals are to reduce the incidence of preventable disease and improve the management of existing osteoporosis in the community. The program does this through a process of education of at risk and diseased populations.

The project objectives for the B.C. demonstration project, shown in Table 2, were arranged in three categories:

Table 2
OPSMP Project Objectives

1. Long Term Objectives	
17.	Improvement in Quality of Life
16.	Reduction in Health Care costs attributable to osteoporosis
15.	Reduction of bone fractures caused by accidents
14.	Reduction of Incidence of Osteoporosis
2. Intermediate Objectives	
13.	Improvement in participant's quality of life
12.	Procurement of permanent funding sources to ensure program continuity
11.	Establishment of community and environmental supports
10.	Creation of ongoing mutual-aid and supports (i.e., self-help groups)
9.	Behavioural and Lifestyle changes
8.	Greater confidence in personal ability to practice healthy lifestyle and/or management of the disease
7.	Greater awareness of osteoporosis in general population
6.	Program to be available in at least 50 B.C. communities.
3. Process Objectives	
5.	2,500 persons will have completed the program
4.	250 four-session courses will have been delivered by trained volunteers
3.	Six volunteers will have been trained as Program Trainers
2.	400 volunteers will have completed leader training workshop
1.	50 two-day leader training workshops will have been conducted

Process Objectives (Objectives 1 through 5).

These represent the activities that were to be completed during the two-year project in order for the program to be firmly implemented. The projections were based on the experience of The Arthritis Society of B.C. in implementing the Arthritis Self-Management Program throughout British Columbia. In planning OPSMP implementation, the project team was aware of the differences in size and scope of these two organizations, especially in the community infrastructure ; The Arthritis Society had a more extensive and established community support system. However, information on implementation of the arthritis program was used as a guideline. These projections were to be monitored closely during the project implementation to assess their feasibility.

Intermediate Objectives (Objectives 6 through 13).

These represented the impacts that the OPSMP was hypothesized to bring about in program participants and in the communities and were to be the major focus of the project monitoring and evaluation. Specifically:

- 6 - The program will be available to women in at least 50 B.C. communities.
- 7 - There will be a greater awareness of osteoporosis in the female population;
- 8 - The women who complete the program will have greater confidence in their personal ability to practice a healthier lifestyle, and/or to manage their osteoporosis.
- 9 - The women who complete the program will have made positive behavioural and lifestyle changes. Behaviours studied in the evaluation process will include: exercise, nutrition, medication use, smoking, and accident prevention.
- 10 - Several communities will have started osteoporosis self-help groups;
- 11 - At least 400 women will participate in the training activity to become leaders and deliver the program.
- 12 - Women who complete the program will feel that their quality of life has been improved.

Long Term Objectives (Objectives 14 through 17).

These objectives are long-ranged and may be realized in 10 to 20 years. It may be logically deduced, however, that they should follow the successful attainment of the intermediate objectives.

III. OPSMP IMPLEMENTATION

Table 3 shows the locations and number of training sessions for OPSMP leaders. Table 4 shows where the program was implemented and the number of participants.

Table 3
Location of Leader Training Workshops and Number of Graduates

Location	No. of Training Sessions	No. of Graduates	Location	No. of Training Sessions	No. of Graduates
Burnaby	1	8	Port Alberni	1	8
Comox	2	17	Powell River	1	7
Coquitlam	1	12	Prince Rupert	1	5
Duncan	1	6	Richmond	2	16
Kamloops	1	3	Smithers	1	6
Kelowna	1	7	Vancouver	4	39
Nanaimo	1	7	Vernon	1	8
Nanoose Bay	1	8	Victoria	2	16
North Vancouver	1	14	White Rock	2	17
Penticton	1	7	Whistler	1	6

As shown in Table 3, 217 persons from 20 different locations were trained to lead the Osteoporosis Prevention and Self-Management Program.

Once the leaders were trained they were responsible for arranging the course in their community. This involved selecting a trained co-leader, finding a suitable location, and advertising the course throughout the local community. Table 4 shows the locations and community settings where the courses were delivered and the number of class participants.

Table 4
OPSMP Class Locations and Number of Participants

Location	Community Setting	No. of Classes	No. of Participants	Total no. of Participants
Burnaby	Confederation Center	4	39	50
	Edmonds Community Center	1	11	
Comox	Comox Valley Nursing Center	1	9	9
Coquitlam	Dogwood Pavilion	3	27	27
Delta	Kinsmen Recreation Center	1	4	4
Duncan	Duncan United Church	1	14	14
Kimberley	East Kootenay Health Unit	1	9	9
Langley	Langley Youth Resource Center	1	6	6
New Westminster	Century House	2	26	32
	New Westminster Secondary	1	6	
North Vancouver	Silver Harbour Centre	2	17	56
	William Griffin Centre	2	20	
	Capilano Mall	1	6	
	Delbrook Baptist Church	1	13	
Parksville	Mount Arrowsmith	2	21	21
Penticton	South Okanagan Health Unit	2	21	21
Prince Rupert	Skeena Health Unit	1	21	21
Richmond	Minoru Place	3	28	35
	Hugh Boyd School	1	7	
Saanich	Silver Threads Senior Centre	1	9	9

Table 4 Continued

Location	Community Setting	No. of Classes	No. of Participants	Total no. of Participants
Surrey	Newton Seniors Centre	2	14	23
	Sunrise Pavilion	1	9	
Vancouver	OSTOP	2	14	209
	Barclay Manor	4	35	
	West End Community Centre	1	9	
	Kerrisdale Community Centre	1	14	
	Mt. Pleasant Community Centre	1	8	
	Eric Hamber Secondary School	1	7	
	Brock House	1	6	
	South Granville Seniors	2	13	
	Renfrew Community Centre	2	18	
	Jewish Community Centre	3	26	
	Sunset Community Centre	1	6	
	Kerrisdale Seniors Centre	1	6	
	Kitsilano Community Centre	1	11	
	Vancouver General Hospital	1	9	
	False Creek Community Centre	1	15	
	Arbutus Manor	1	12	
Vernon	Schubert Seniors Centre	2	22	22
Victoria	Sidney Silver Threads	1	8	41
	James Bay	1	22	
	Goward House Society	1	5	
	Fairfield New Horizons	1	6	
West Vancouver	West Vancouver Seniors Centre	2	16	16
Whistler	Meadow Park Sports Complex	1	12	12

During the project, the OPSMP was available in 21 different communities throughout British Columbia. Eight hundred and thirty five persons participated in the OPSMP in 46 community settings.

IV. OPSMP EVALUATION

The Osteoporosis Prevention and Self-Management Program evaluation focused on the following four objectives:

- there will be a greater awareness of osteoporosis among health care professionals and generally in the female population,
- participants will have greater confidence in their ability to practice a healthier lifestyle, and/or to manage their osteoporosis,
- participants will make positive behavioural and lifestyle changes. Behaviours studied in the evaluation will include: exercise, nutrition, medication use, smoking, and accident prevention, and
- participants will feel less pain, perceive themselves to be in better health and feel that their quality of life has been improved.

To evaluate whether these objectives had been achieved, four separate studies were conducted:

1. A study to determine if the program had brought about a general increase in awareness and importance of osteoporosis among health care professionals.
2. An impact study to determine whether:
 - a) program participants made behaviour and/or lifestyle changes that were suggested by the program;
 - b) program participants increased their perception of confidence in their ability to engage in healthy behaviours that prevent osteoporosis, or behaviours to manage osteoporosis;
 - c) participants' perceived health status and quality of life increased by participating in the program.
3. A study to obtain participants' perceptions of the benefits they had experienced by participating in the program.
4. A follow-up telephone survey to selected OPSMP participants

Ethical approval for all evaluation activities was obtained from the Ethics Department at the University of British Columbia (Appendix C).

Study 1 - Awareness and Importance of Osteoporosis Among Health Care Professionals

Methodology

In January of 1995, a survey was conducted with Continuing Care staff working in provincial health units across British Columbia. The survey was conducted by e-mail with the cooperation of the Ministry of Health. A two-page survey (Appendix D) containing five questions, was e-mailed to Continuing Care Managers in each health unit. The five questions asked were:

1. Are there other osteoporosis educational programs available in your community?
2. Are there other programs (any type) in your community aimed at preventing or managing the problems associated with osteoporosis?
3. How important a health problem is osteoporosis in your community?
(5 point Likert scale from "not important" to "extremely important")
4. Continuing Care health professionals are adequately informed about osteoporosis and the associated effects.
(5 point Likert scale from "strongly disagree" to "strongly agree")
5. What percent of your time as a health professional do you think should be devoted to the prevention and treatment of osteoporosis?

The health units were surveyed a second time during September of 1996 (20 months later). The same five questions were asked.

Results

A total of 215 Continuing Care staff from 30 provincial health units participated in this survey. The health units involved were:

Burnaby (3 units)	Langley
Campbell River	Maple Ridge
Cariboo	North Shore (2 units)
Castlegar	Port Hardy
Courtenay (2 units)	Powell River
Cranbrook	Prince George
Dawson Creek	Quesnel
Duncan	Richmond
Kamloops	Vancouver (7 units)
Kelowna	Victoria

1. Are there other osteoporosis educational programs available in your community?

In the pre-survey, 20% of provincial health unit Continuing Care professionals were aware of other osteoporosis education programs available in their community. In the post-survey, this number increased to 50%, indicating that either the number of osteoporosis education programs had increased or that health professionals were now more aware of osteoporosis education programs in their community.

2. Are there other programs (any type) in your community aimed at preventing or managing the problems associated with osteoporosis?

In the pre-survey, half of the health units were aware of other types of programs which included the prevention and management of osteoporosis. The same result was found in the post-survey.

3. How important a health problem is osteoporosis in your community?

In the pre-survey respondents rated the importance of the problem of osteoporosis in their community as 3.93 on a 5 point scale. This increased to 4.04 in the post-survey and therefore shows that osteoporosis is being perceived as a more important health problem among health professionals.

4. Continuing Care health professionals are adequately informed about osteoporosis and the associated effects.

In the post-survey, health care professionals felt that they were more adequately informed about osteoporosis and the associated effects (the average score increased from 2.98 to 3.00).

5. What percent of your time as a health professional do you think should be devoted to the prevention and treatment of osteoporosis?

The percentage of time health professionals felt should be devoted to the prevention and treatment of osteoporosis, however, decreased from 11.6% in the pre-survey to 8.59% in the post-survey. Several factors may account for this change.

In conclusion, the results of the survey indicate that at the post-survey, Continuing Care health professionals:

- were more aware of osteoporosis programs in their community
- were not aware of additional programs that included preventing or managing problems associated with osteoporosis
- felt that osteoporosis was more important as a health problem
- were more informed about osteoporosis and its associated effects

In spite of Continuing Care professionals' increased awareness of community osteoporosis education programs and the importance of osteoporosis as a health problem, there was a slight decrease in the amount of time they felt they should devote to osteoporosis.

Study 2 - Impact Study

Methodology

Study consent forms and evaluation questionnaires (Appendix E) were given to each participant at the first session. Participants were asked to complete the questionnaire and return it to the leader at the beginning of the second session. The leaders briefly perused the questionnaires for completeness and forwarded them to the project researcher. Six months later, post-program questionnaires were sent to each participant by the project researcher. Participants were asked to complete the questionnaire and return it in the addressed stamped envelope provided. If the completed questionnaire was not received within 2 weeks, a follow-up postcard was mailed to the participant. If there was no response within 10 days, the participant was telephoned. When participants were called directly, they either requested another questionnaire or they completed the questionnaire over the telephone.

The pre- and post-program questionnaire contained questions in the following areas:

- Demographic information
- Dietary intake
- Health beliefs relating to osteoporosis
- Exercise behaviours
- Osteoporosis self-efficacy
- Outcome measures of quality of life, perceived health status, and pain level

Results

In total, 189 OPSMP participants completed the questionnaires. Table 5 provides a profile of the OPSMP participants who completed the questionnaires.

Table 5

Profile of the 189 OPSMP Participants who Completed the Pre- and Post-Program Questionnaires

Age (years)	57.8	SD 14.6
Gender	Female 183 Male 6	
Education (years)	13.6	SD 3.0
Smoker	Yes 16 No 173	
Ex-smoker	Yes 66 No 125	
Weight (pounds)	141	SD 25.0
Employment Status	Working 53 Seeking work 13 Homemaker 25 Retired 81 Other 17	
Marital Status	Married 119 Single 46 Widowed 24	

Of the 189 respondents, 67 people had been diagnosed with osteoporosis and 122 did not have osteoporosis. Statistical tests were conducted to determine if these two groups were different with respect to demographic characteristics.

The groups were different in three ways:

1. The osteoporosis group was older. The average age of the people in the osteoporosis group was 66 years while the average age of the people who did not have osteoporosis was only 53 years.
2. The group who did not have osteoporosis had more education - 14 years compared to 13 years for the osteoporosis group.
3. A greater proportion of the group who did not have osteoporosis was either working or seeking work, while a majority of the osteoporosis group was retired.

Exercise Behaviours

Participants were asked to report the number of times they engaged in five types of exercise during the past month and the average amount of time they spent at each exercise. The exercises included were: walking, aerobics, dancing, strength training, and other. The significance levels of the changes are shown in Table 6.

Table 6
Pre- and Post-program Significant Levels of Changes in Exercises for Total Sample, Osteoporosis Group, and Group Without Osteoporosis

	Total Sample (N = 189)	Osteoporosis Group (N = 67)	Group without Osteoporosis (N = 122)
<u>Walking</u>			
Number of times	.006	.018	.087
Average minutes/time	.008	.001	.517
Total (times x min)	.035	.021	.526
<u>Aerobics</u>			
Number of times	.904	.959	.907
Average minutes/time	.403	.529	.563
Total (times x min)	.251	.772	.275
<u>Dance</u>			
Number of times	.349	.325	.867
Average minutes/time	.217	.707	.243
Total (times x min)	.293	.866	.182
<u>Strength Training</u>			
Number of times	.957	.825	.749
Average minutes/time	.421	.150	.208
Total (times x min)	.599	.145	.329
<u>Other Exercise</u>			
Number of times	.061	.059	.510
Average minutes/time	.701	.142	.561
Total (times x min)	.496	.358	.486

Significant levels are bolded.

Table 7 shows the number of people who were engaged in each of the five exercise activities for pre- and post-test as well as the frequency of times they were involved.

Table 7
Frequencies of Participants in Each of Five Categories of Exercise

	At least once	1-10	11-20	20+
<u>Walking</u>				
Pre	165	58	55	51
Post	137	46	47	44
<u>Aerobics</u>				
Pre	48	32	14	2
Post	53	36	14	3
<u>Dance</u>				
Pre	28	25	3	---
Post	21	19	2	---
<u>Strength Training</u>				
Pre	44	22	15	7
Post	50	29	15	6
<u>Other</u>				
Pre	64	26	32	6
Post	60	30	18	12

As shown in Tables 6 and 7, fewer people were engaged in walking as an exercise at the post-questionnaire. However, the people who were walking reported walking longer periods of time. This is particularly true for the group with osteoporosis.

There were no statistically significant changes in the area of Aerobics, Dancing, Strength Training, and Other Exercise activity. Statistical tests were conducted to determine whether participants engaged in a greater variety of activities from pre- to post-test. There was only a marginal change in that at post-test people were doing slightly fewer activities. Eighty-seven of the 189 participants in this study were doing the same number of different activities from pre- to post-test.

Dietary Intake

Participants reported the number of times they had consumed four specific foods during the last two days. These included milk products, hard cheese, yogurt, and canned fish. Table 8 shows the significance levels of the change from pre- to post-questionnaire.

Table 8
Pre- and Post-Program Significant Levels of Changes in Dietary Products for Total Sample, Osteoporosis Group, and Group Without Osteoporosis

	Total Sample (n = 189)	Osteoporosis Group (n = 67)	Group without Osteoporosis (n = 122)
<u>Milk</u>			
Tea/Coffee	.242	1.000	.184
Cereal	.448	0.604	.569
Glass of milk	.206	0.452	.303
Soy milk	.453	0.531	.546
<u>Hard Cheese</u>	.629	.904	.627
<u>Yogurt</u>	.565	.252	.084
<u>Canned Fish</u>	.822	.760	.932

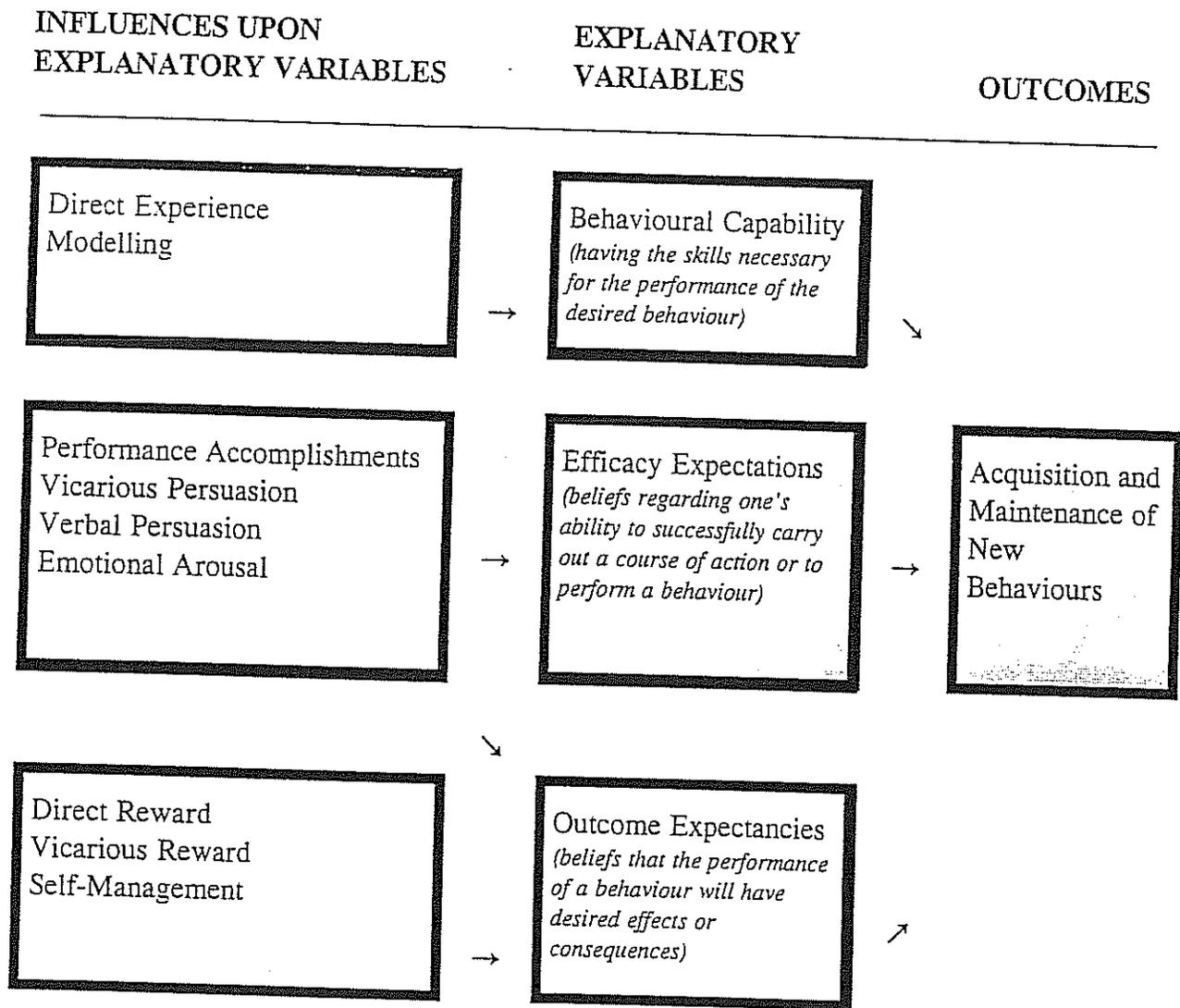
* Statistical significance would be indicated by a bolded score; there were no statistically significant changes.

As shown in Table 8, there were no statistically significant changes in the number of times people consumed these products during the last two days from pre- to post-questionnaire.

Osteoporosis Self-Efficacy

Self-efficacy is defined as people's judgements of their capabilities to organize and execute courses of action required to attain designated types of performances. Self-efficacy theory is based on the interactive model of human behaviour set out in Bandura's (1986) social cognitive theory. It posits the individual as a central processor of efficacy information who processes, weighs, and synthesizes diverse pieces of information concerning his/her capability, and then determines his/her choice of behaviours and effort expenditure accordingly. Beliefs about self-efficacy affect the intention to change a behaviour, the effort expended to attain this goal, and the level of perseverance to continue striving in spite of setbacks that may undermine motivation (Bandura, 1991).

Figure 1
Social Learning Theory: Components and Processes*



* The shaded areas reflect self-efficacy theory's place within social learning theory.

In the pre- and post-program questionnaire participants were asked how confident they were in carrying out a number of activities which are related to the prevention and/or management of osteoporosis. Participants were asked to report their level of confidence on a scale. The scale ranged from 10 for "not very confident" to 100 for "very confident" and would be in intervals of 10. The participant's reply to each question would constitute the strength of self-efficacy in that particular area.

OPSMP participants were asked: **HOW CONFIDENT ARE YOU THAT YOU**

1. Can walk at a moderate pace for 30 minutes?
2. Could maintain a regular walking program for the next month?
3. Can ask your doctor questions about osteoporosis?
4. Can ask your doctor about hormone replacement therapy?
5. Can consume foods high in calcium such as dairy products at least 2 times a day?
6. Can give up smoking if a smoker?
7. Can do something to feel better if you are feeling down?
8. Can carry out activities that will reduce the possibility of having a fall?
9. Can continue most daily activities?
10. Can manage your symptoms so that you can do the things you enjoy doing?
11. Can deal with the frustrations caused by osteoporosis?
12. Can keep discomfort from interfering with your sleep?

Questions 10 - 12 were completed only by those who had been diagnosed with osteoporosis.

The Osteoporosis Prevention and Self-Management Program used “self-efficacy enhancing strategies” to attempt to raise participants’ confidence in their ability to accomplish the 12 activities.

Results

Table 9 shows the statistical levels of significance of the changes between the scores at pre-program and at six months.

Table 9

Statistical Significance Levels of Changes in Scores of Self-Efficacy Questions From Pre-Program to Six Months

Self-Efficacy Questions	Group With Osteoporosis n = 67	Group Without Osteoporosis n = 122
1	.008	.313
2	.546	.248
3	.270	.343
4	.003	.014
5	.301	.160
6	.632	.811
7	.796	.018
8	.042	.127
9	.427	.000
10	.050	
11	.000	
12	.003	

Bolded scores signify “statistical significance”.

The group with osteoporosis made six statistically significant changes from pre- to post program on questions 1, 4, 8, 10, 11, and 12. Question 6 which asks participants’ “their confidence to quit smoking” should be omitted because only six persons in the osteoporosis group and ten persons in the group which did not have osteoporosis smoked to begin with.

The group with osteoporosis felt more confident in being able to:

- walk at a moderate pace for 30 minutes,
- ask their doctor about hormone replacement therapy,
- carry out activities that would reduce the possibility of having a fall,
- manage their symptoms to continue to do the things they enjoyed doing,
- deal with the frustrations caused by osteoporosis, and
- keep discomfort from interfering with their sleep.

The group of persons who did not have osteoporosis answered questions 1 - 9. They felt more confident in being able to:

- ask their doctor about hormone replacement therapy
- do something to feel better if they were feeling down, and to
- continue most daily activities.

Health Beliefs about Osteoporosis

According to the Health Belief Model (Figure 2), a number of variables are associated with the likelihood of taking action to prevent the occurrence of a disease (Janz & Becker, 1984). Health behaviours are more likely to occur if an individual believes in personal susceptibility to the condition and, at the same time, perceives that having the condition would have serious consequences. The model also recognizes the impact of health motivation and perceived barriers and benefits to taking the healthful action.

The Osteoporosis Health Belief Scale (Kim, Horan, Gendler & Patel, 1991) was developed to measure health beliefs related to osteoporosis. It is a 35-item self-report questionnaire (questions 26-50 of Appendix E) based on the Health Belief Model which is specifically designed to assess beliefs related to exercise behaviours and calcium intake in elderly persons. The instrument consists of five subscales: Susceptibility, Severity, Benefits, Barriers, Health Motivation,

The model posits that to get someone to engage in healthful behaviours that may help prevent osteoporosis one would need to :

- increase his/her belief of susceptibility to osteoporosis
- increase his/her perception of the severity of osteoporosis
- increase his/her beliefs regarding the benefits of exercising and increasing calcium intake
- decrease his/her beliefs regarding the barriers to exercising and taking calcium
- increase his/her health motivation.

The Osteoporosis Health Belief scales were completed by the 122 OPSMP participants who did not have osteoporosis at two time points - at the beginning of OPSMP and again six-months later. Table 10 shows the significance levels of the change scores for the five categories.

Figure 2

Health Belief Model

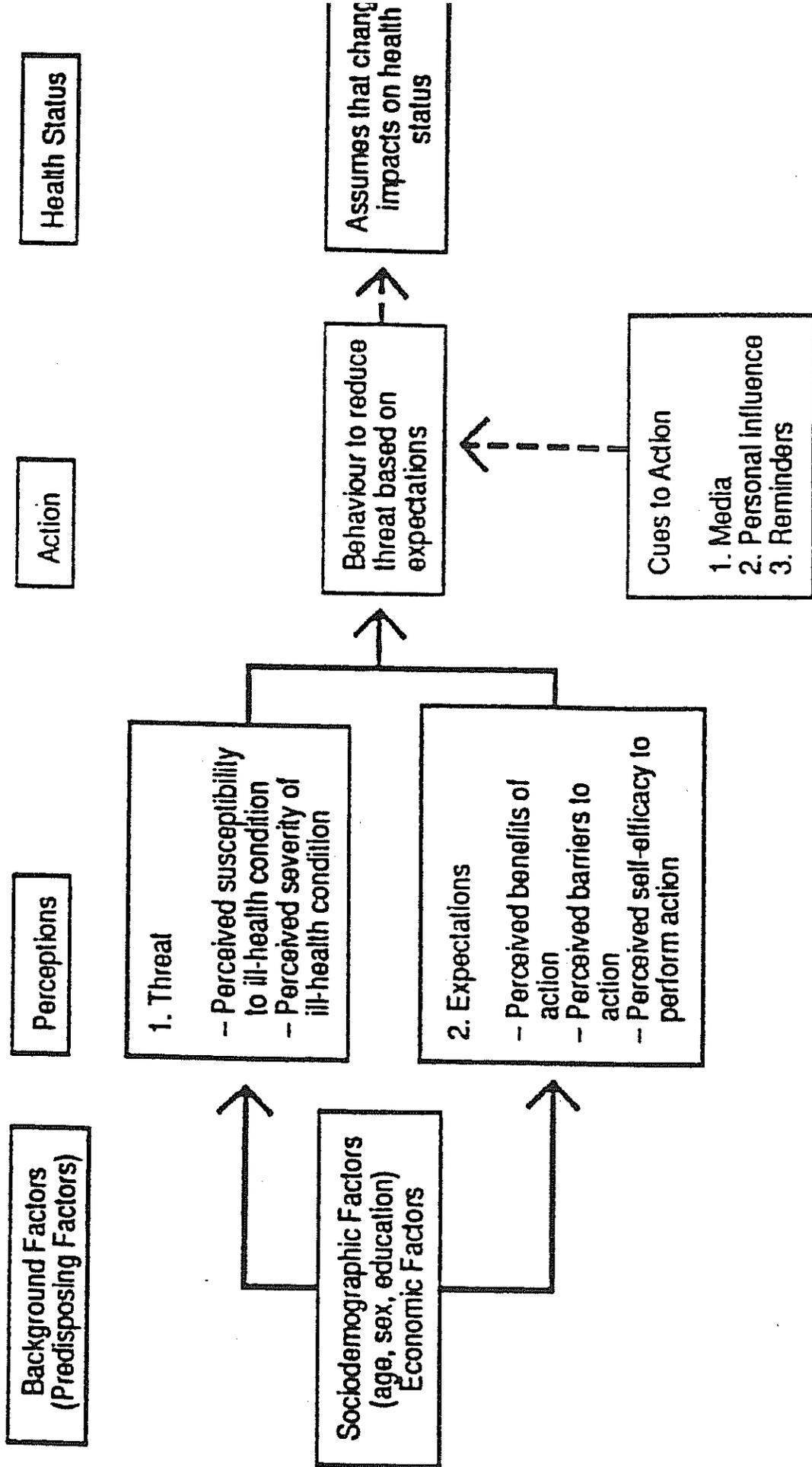


Table 10
Significance Levels of Change Scores of the Five Subscales of the Osteoporosis Health Belief Scale (n = 122)

Subscale	Pre-Score	Post-Score	Significance Level
Susceptibility	2.82	2.75	.392
Severity	3.29	3.44	.050
Benefits	4.04	4.18	.041
Barriers	2.54	2.55	.906
Health Motivation	4.16	4.35	.001

Bolded scores signify "statistical significance".

The results show that there were statistically significant changes in three of the five subscales of the Osteoporosis Health Belief Scale. Specifically, six months after they participated in OPSMP participants:

- had increased their perception regarding the severity of osteoporosis,
- had stronger beliefs regarding the benefits of exercising and increasing their calcium intake, and
- had stronger motivation to stay healthy.

Pain Level, Perceived Health Status, and Quality of Life

Pain level and quality of life were measured by visual analogue scales. The Pain Visual Analogue Scale (Downie et al., 1978; Revill et al., 1976; Dixon & Bird, 1981, Scott & Huskisson, 1979; Turk et al., 1983) has been used extensively to ascertain an individual's perception of his/her pain level. Respondents are asked to place a mark along a 10 cm line where one end reads "No Pain" and the other end reads "Pain as bad as could be." The Quality of Life Analogue Scale operates in much the same way as the Pain Scale except they are requested to record their quality of life on a scale from "Worst possible life" to "Best possible life". The scales are shown below.

PAIN

“We are interested in learning whether or not you are affected by pain. Please mark an X on the line below to describe your PAIN in the recent past.”

Worst possible pain | _____ | No Pain

QUALITY OF LIFE

“Take a moment to think of the best possible life and the worst possible life. On the line below place an X to indicate where your life is today.”

Worst possible life | _____ | Best possible life

The “general health” question was taken from the Medical Outcomes Study (Ware et al., 1992). Respondents were asked: “*In general, would you say your health is?*” : Excellent (scored as 0), Very Good (scored as 1), Good (scored as 2), Fair (scored as 3), or Poor (scored as 4). The scale has a test retest reliability of .92 (Stewart, Hays, & Ware, 1988), and has a long history of use in general health population surveys such as the 1990 Canadian Health Promotion Survey (Health and Welfare Canada, 1993) and the Violence Against Women Survey (Statistics Canada, 1994). The scale is shown below.

In general, would you say your health is:

(circle one)

- Excellent 1
- Very Good 2
- Good 3
- Fair 4
- Poor 5

OPSMF participants completed the scales before they started the program and again six months later. Table 11 shows the changes from pre- to post-questionnaire.

Table 11

Pre and Post Program Changes on Pain, Quality of Life, and Perceived Health Scores for the 189 OPSMP Participants

Total Participants (n = 189)

Measure	Pre-Score		Post-Score		Level of Significance
Pain	6.04	SD 2.78	6.57	SD 3.02	.074
Quality of Life	6.74	SD 2.17	7.21	SD 1.87	.001
Health Status	2.69	SD 0.89	2.27	SD 0.88	.000

Group with Osteoporosis (n = 67)

Measure	Pre-Score		Post-Score		Level of Significance
Pain	5.23	SD 2.36	5.58	SD 3.01	.475
Quality of Life	6.09	SD 2.24	6.67	SD 2.18	.039
Health Status	3.02	SD 0.83	2.65	SD 0.80	.004

Group who did not have Osteoporosis (n = 122)

Measure	Pre-Score		Post-Score		Level of Significance
Pain	6.56	SD 2.92	7.20	SD 2.87	.085
Quality of Life	7.09	SD 2.05	7.51	SD 1.62	.013
Health Status	2.48	SD 0.86	2.04	SD 0.79	.000

As shown in Table 11, OPSMP participants felt that their quality of life had improved and that they were in better health as a result of participating in the program. Both the group with osteoporosis and the group who did not have osteoporosis felt this way.

Additional Participant Feedback

Of the 189 participants who completed the post-program questionnaire, 79 filled out the “additional comments” section on the last page. Content analysis was conducted and common themes were extrapolated. Several major themes emerged. Examples of the comments are given to illustrate the themes.

A. Increase in knowledge and awareness of osteoporosis

Participants reported an increase in their knowledge and awareness of osteoporosis, the causes, prevention and management of the condition. Words used to describe their experience included: “enlightening,” and “great insight.” Sharing of information was reported.

“The fitness classes I teach are all for seniors, so I feel this is a good way to give them more information to improve their lifestyle.”

“... have passed on all the information to my 3 married daughters for themselves and their families.”

B. Personal responsibility

The importance of personal responsibility in preventing and managing the condition was cited.

“It’s up to me, or the person involved re: osteoporosis.”

“I did find the course very useful, made me aware of the importance of self-care.”

“I strongly believe in self-preservation: “An ounce of prevention is worth a pound of cure” as the old saying goes.”

C. Increased confidence in managing osteoporosis

As a result of taking the program, participants felt increased confidence in managing osteoporosis.

“I am now so confident about these things... very confident that I can maintain or improve my condition.. It [the program] was the best thing that ever happened to me.”

D. Group process

Frequently mentioned was the group process and the mixture of ages and persons with and without osteoporosis.

"It was especially insightful to have a group of mixed ages, including those with and without osteoporosis, to learn the concerns at both ends."

"... sitting right next to an older woman who had sustained a fractured vertebrae from putting a 20 pound turkey in the oven blew my mind! Definitely instilled motivation to pursue a preventative approach to aging process."

The value of having a group leader with osteoporosis was mentioned.

"My instructor has been an excellent example into how lifestyle changes can improve your quality of life and reduce fracture risk due to osteoporosis."

Also cited was the social benefit of groups. Participants reported that they were still meeting together even after the program had concluded. Participants appreciated the "support" from the members and the sharing of information and experiences.

"The course brought together a group of us with similar problems... besides the exchange of ideas, information etc. we were a great support to one another."

E. The need to increase awareness of osteoporosis prevention

What was mentioned most frequently was the need to increase the awareness of osteoporosis prevention with the younger generation. It was felt that efforts should be concentrated with this target group.

"This program should be targeted at school-aged girls."

"Most importantly I realize it is vital we get the "prevention message" over to our younger generation."

"It seems to me that some means must be found to reach young girls early enough to start on such a simple regime, "prevention better than cure," without too much effort on their part."

Also of concern was the lack of awareness in the health care community. Several comments addressed the issue of health professionals needing to be more knowledgeable in

order to help patients.

"Only a few years ago when I was still working as an RNA in Alberta, it [osteoporosis] was hardly ever mentioned. I think doctors should do more teaching with their young female patients - they should impress the consequences upon them, early on."

"This knowledge must reach all women's clubs and groups and above all doctors..."

"My doctor (who was male) said it was all in my head. I changed doctors (a woman) who gave me a thorough check-up. I was diagnosed with osteoporosis in July..."

F. Personal experiences

Personal experiences of difficulties with the health care system were mentioned. Services for people diagnosed with osteoporosis were lacking.

"I used to have a homemaker come in once every 2 weeks... since all spending was cut so are the things that would make my life a bit more enjoyable."

"Was sent a homemaker who is not allowed to sweep a floor of a small patio, do ironing... I feel our health care system is sadly lacking."

The issue of the importance of bone density testing was cited.

"Due to the cost of osteoporosis to our medical system, which will increase as more of us age, it would seem the need to lobby the government re: the need for bone density studies at menopause. This should become a priority for women. The savings in dollars and pain would be enormous."

Also mentioned was the unavailability of bone density testing for some people.

I am told that people from here have to go to Vancouver for a bone density scan to detect osteoporosis. This makes diagnosis here impossible. It has to be severe enough to be recognized in an x-ray here [Kamloops]."

G. Difficulty of maintaining a regular exercise program

Concern was expressed over the inability to maintain a regular exercise program. While realizing the importance of exercise, participants were finding that factors such as other health concerns, weather, personal safety, and lack of time were preventing them from exercising regularly.

"Every time I start a regular exercise program, something interferes... I do understand the importance of doing regular exercise and I am working on it!"

"Tiredness - whether blood sugar or other causes, seems to restrict the amount of length of exercises undertaken."

"I can't do regular exercise because where I work it is a lot of walking and holding down two jobs sometimes does not allow you to do anything."

Study 3 - Participants' Opinions Regarding the Benefits of the OPSMP

The intent of this study was to provide an opportunity for OPSMP participants to describe what they found beneficial in the program. The research methodology of Study 2 did not enable participants to describe what they got out of the course in a free and open-ended manner because they had to respond to pre-determined questions set out in a questionnaire.

Methodology

Persons who had completed the OPSMP were telephoned by the research assistant and invited to attend a follow-up meeting. Three separate meetings were held and were attended by 20 women. At each meeting the group participated in a modified nominal group technique and answered the following question:

“What benefits did you get out of the OPSMP?”

The groups developed a list of approximately 50 benefits they felt they had received by participating in the program. A fourth meeting was held to develop an interview questions from the list of 50 benefits that would be used to interview other program participants. Six participants participated in this meeting and 16 questions (Appendix F) were developed in six main areas:

- A - Diet and Calcium
- B - Exercise and Activity
- C - Awareness and Understanding
- D - Personal Capability
- E - Responsibility for one's own health
- F - General Questions

The six OPSMP participants agreed to become research assistants, undergo a brief training on interviewing, and interview women who had already taken the OPSMP. The research assistant contacted program participants to arrange the interviews. A total of 27 interviews were conducted by four persons. Each interview was taped and lasted approximately 45 minutes. The interviews were then transcribed and a content analysis was conducted to extrapolate the common themes across the interviews. The complete results of the interviews are contained in Appendix G.

Results

In summation, the Osteoporosis Prevention Self Management Program appears to have had a positive impact.

Participants' levels of knowledge increased by varying amounts. Those participants who were not knowledgeable about osteoporosis gained basic knowledge about the nature of the condition, such as: the prevalence of osteoporosis; that it can affect people of any age or sex; the need to build up bone density early in life; and that the condition can be undetected until the time of a fracture. Participants also became aware of the importance of calcium in prevention of osteoporosis, including: the amount of calcium needed throughout life; food sources of calcium; use and types of calcium supplements; and the need for Vitamin D and magnesium for calcium absorption. Participants also gained from the information on the importance of consistent exercise in the prevention of osteoporosis, including definition of weight-bearing exercise. Those who were knowledgeable reported that the information presented in the course provided them with a clearer understanding of osteoporosis or reinforced what they already knew. New information allowed participants to have more choice when making decisions.

The most salient result of the course was the change in health behaviour, both for those with osteoporosis or those who wished to prevent development of osteoporosis.

Increase in use of food sources of calcium was reported. Participants were mentally calculating their daily calcium intake and assessing their need for calcium supplements. For those who already reported an adequate calcium intake, the course reinforced that what they were doing was appropriate. In relation to exercise, there was an increase in frequency of exercise and a change in the way participants were exercising based on the information provided in the course. For those already engaged in exercise, the course reinforced that their exercise activities were appropriate. The emphasis on the importance of exercise in the prevention and management of osteoporosis led to an increase in motivation to continue or improve upon their exercise activity.

Participants who were diagnosed with osteoporosis reported an increase in those behaviours that would reduce their risk of fractures. Participants were more safety conscious. New behaviours included: wearing proper footwear; avoiding icy, slippery conditions; watching out for hazards on the floor; and lifting less.

An additional behaviour change was an increase in the discussion of osteoporosis. Better informed as a result of the course, participants reported asking more questions of their health professionals. Discussion of osteoporosis increased among participants' family and friends. All participants reported sharing some aspect of the course with others. Some referred people to the course while others lent out the course book. Family members were encouraged to take preventative measures against osteoporosis.

Significant for all participants was the increased awareness of osteoporosis as a day to day health issue. The course was "consciousness raising." Osteoporosis was entering participants minds when they were making decisions about diet (choosing calcium rich foods) or activity (walking rather than driving, taking the stairs rather than the elevator).

Participants also reported changes in their perceptions of their capability to have some control over the development of osteoporosis. That is, many learned that osteoporosis did not have to be "inevitable" for some people. A number of participants were not aware that osteoporosis could be prevented and were critical of the health care system for failing to bring this to their attention. Because of the information that activities such as ensuring adequate calcium intake and engaging in consistent exercise could have some benefits in preventing and managing osteoporosis, participants felt more resolute about doing these activities and felt confident that they were carrying out the appropriate activities by following the guidelines in the course.

In addition, participants realized that prevention and management of osteoporosis was a personal responsibility. The course increased their feelings of self-responsibility.

The benefit of the group experience was noted. Participants reported that participation in a group was superior to reading a book because of the sharing of different perspectives and experiences. Social contact was also cited as a benefit.

Generally, both those with and without a diagnosis of osteoporosis found the course to be beneficial. The Osteoporosis Prevention Self Management Program course increased the awareness of osteoporosis for participants and was the impetus for the adoption or continuation of some health behaviour. As one participant noted:

"We don't have to be helpless victims.... There are things that we can do to prevent it or to minimize the impact.... We have a responsibility to do those things."

Study 4 - Follow-up Telephone Survey of OPSMP Participants

A follow-up phone interview was conducted with 160 OPSMP participants (those participants who provided information to allow phone contact). The interview was conducted at the conclusion of the two year OPSMP program study, during the months of July, August and September, 1996.

Of the 160 participants, 122 were successfully contacted by phone. Reasons for the inability to contact included: wrong phone number provided, phone number out of service, answering machine only, and failure of participants to return the call when a message was left.

The six interview questions (Appendix H), developed by the Project Advisory Committee, asked about behaviours since taking the OPSMP program. The phone interview took between 5 and minutes to complete and none of the participants reached declined to participate in the interview.

Of the 122 participants contacted by phone, 46 (38 %) were diagnosed with osteoporosis and 76 (62 %) were not diagnosed with osteoporosis.

The first interview question dealt with the issue of bone density testing. Participants were asked if they had a bone density test since taking the program. Of the 122 participants, 26 (21 %) reported that they had taken a bone density test since taking the program. A statistical test (i.e., Chi-square) showed that there was a difference between the group who did not have osteoporosis and the group which had osteoporosis. Of those without osteoporosis, 7 (9%) had taken a bone density test, and of those diagnosed with osteoporosis, 19 (41%) had taken a bone density test.

The second interview question asked whether participants had fallen since taking the program. Of the 122 participants, 18 (15%) reported having a fall since taking the program. Of those without osteoporosis, 8 (11 %) reported having a fall, and of those diagnosed with osteoporosis, 10 (22 %) reported having a fall.

The third interview question asked addressed the issue of increased calcium intake since taking the program. 63 participants (52 %) reported taking more calcium since taking the program. Of those without osteoporosis, over half, 43 (57%) were taking more calcium, and of those diagnosed with osteoporosis, 20 (44%) were taking more calcium. Of all participants who reported taking more calcium, 20 (32%) reported increasing their calcium through food only, 13 participants (21%) reported increasing their calcium through calcium supplements only, and 30 participants (48%) reported increasing their calcium through food and calcium supplements together. Most participants who did not report an increase in calcium intake

noted that they had an adequate amount of calcium intake prior to taking the program.

The fourth interview question asked whether participants had shared information from the program with family and/or friends since taking the program. A large majority of participants, 114 (93%) reported sharing information from the program with family and/or friends. Of those without osteoporosis, 71 (93%) had shared information with family and/or friends, and of those diagnosed with osteoporosis, 43 (93%) had shared information with family and/or friends.

The fifth interview question asked whether participants had discussed the prevention or treatment of osteoporosis with their doctor since taking the program: 53 participants (43%) reported that they had discussed the prevention or treatment of osteoporosis with their doctor since taking the program. The Chi-square statistical test showed that the two groups were different. Of those without osteoporosis, 23 (30%) had discussed with their doctor, and of those diagnosed with osteoporosis, 30 (65%) had discussed with their doctor. Many of those who did not discuss the topic of osteoporosis with their doctor explained that other health concerns had taken priority in the appointment with their doctor.

The sixth interview question asked if participants had increased their exercise activity level (especially weight bearing exercise) since taking the program: 50 participants (41%) reported increasing their exercise activity level since taking the program. Of those without osteoporosis, 33 (43%) had increased their exercise activity level, and of those diagnosed with osteoporosis 17 (37%) had increased their exercise activity level. Again, as in the case of calcium intake, some participants reported that they were already exercising at an adequate level before taking the program.

V. PROJECT DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

This report has described the results of four separate studies that were carried out to evaluate the impact of the Osteoporosis Prevention and Self-Management Program carried out as a demonstration project in British Columbia over a two-year period in 1994 to 1996. The demonstration project was conducted by OSTOP, The Osteoporosis Society of British Columbia. It was funded by the Seniors Independence Program of Health Canada.

Project objectives were assessed in two ways. Implementation objectives were monitored by the Project Coordinator and reported to the OSTOP Executive Director and Project Advisory Committee. This process of ongoing review, analysis, problem-solving and modification of implementation objectives facilitated the development of realistic implementation targets over the two-year project period. The program was deemed to be successful in that over the two-year period, 217 persons were trained to lead the program and 68 courses were delivered to 835 persons in 46 community settings.

Impact Objectives were evaluated through quantitative and qualitative research studies which used the principles of Participatory Research. The impact objectives that were assessed in the evaluation were:

1. There will be a greater awareness of osteoporosis among health care professionals and generally in the female population.
2. OPSMP participants will have greater confidence in their ability to practice a healthier lifestyle, and/or to manage their osteoporosis.
3. OPSMP participants will make positive behavioural and lifestyle changes.
4. OPSMP participants will feel less pain, perceive themselves to be in better health, and feel that their quality of life has been improved.

To evaluate whether these objectives had been achieved, four separate studies were conducted:

1. A study to determine if the program had brought about a general increase in awareness and importance of osteoporosis among health care professionals. The research methodology used in this study was a survey of Continuing Care personnel in BC Health Units.

2. An impact study to determine whether:
 - a) program participants made behaviour and/or lifestyle changes that were suggested by the program;
 - b) program participants increased their perception of confidence in their ability to engage in healthy behaviours that prevent osteoporosis, or behaviours to manage osteoporosis;
 - c) participants' perceived health status and quality of life increased by participating in the program.

This study use pre- and post-program questionnaires completed by program participants.

3. A study to obtain participants' perceptions of the benefits they had experienced by participating in the program. This was a qualitative survey of program participants.
4. A follow-up telephone survey to OPSMP participants to determine whether they had engaged in behaviours suggested in the program.

Awareness of Osteoporosis

Evaluation results showed there were increases in awareness of osteoporosis both among health care professionals and in the general population.

The survey of Continuing Care health professionals in B.C. Provincial Health Units found that at the end of the two-year project they were more aware of osteoporosis programs in their community, felt that osteoporosis was more important as a health problem, and were more informed about osteoporosis and its associated effects. However, despite increased awareness of community osteoporosis education programs and perception of osteoporosis as an important health problem, there was a slight decrease in the amount of time the professionals believed they should devote to education programs aimed at preventing and managing osteoporosis. Although this perception was not further explored, it may be that the health professional felt that community education programs about osteoporosis should be delivered by lay people rather than health professionals who are already overburdened by their current workload.

Increased awareness of osteoporosis was found in both the qualitative study conducted with OPSMP participants and in the feedback section of the pre- and post-program

questionnaires. The findings in the qualitative study showed that participants' levels of knowledge increased by varying amounts. Those participants who were not knowledgeable about osteoporosis gained basic knowledge about the nature of the condition, such as: the prevalence of osteoporosis; that it can affect people of any age or sex; the need to build up bone density early in life; and that the condition can be undetected until the time of a fracture. Participants also became aware of the importance of calcium in prevention of osteoporosis, including: the amount of calcium needed throughout life; food sources of calcium; use and types of calcium supplements; and the need for Vitamin D and magnesium for calcium absorption. Participants also gained from the information on the importance of consistent exercise in the prevention of osteoporosis, including definition of weight-bearing exercise. Those who were knowledgeable reported that the information presented in the course provided them with a clearer understanding of osteoporosis or reinforced what they already knew. New information allowed participants to have more choice when making decisions.

Exercise and Dietary Behaviours

The quantitative study found that fewer people were engaged in walking as an exercise at the post-questionnaire. Seasonal variations in climate and conditions may explain these differences. However, the people who were walking reported walking longer periods of time, and this was particularly true for the group with osteoporosis.

The qualitative survey provided valuable insight into changes in exercise and dietary behaviours. Respondents said the most salient result of the course was the change in health behaviour, both for those with osteoporosis or those who wished to prevent development of osteoporosis.

Increase in use of food sources of calcium was reported. Participants were mentally calculating their daily calcium intake and assessing their need for calcium supplements. For those who already reported an adequate calcium intake, the course reinforced that what they were doing was appropriate. In relation to exercise, there was an increase in frequency of exercise and a change in the way participants were exercising based on the information provided in the course. For those already engaged in exercise, the course reinforced that their exercise activities were appropriate. The emphasis on the importance of exercise in the prevention and management of osteoporosis led to an increase in motivation to continue or improve upon their exercise activity.

Participants who were diagnosed with osteoporosis reported an increase in those behaviours that would reduce their risk of fractures. Participants were more safety conscious. New behaviours included: wearing proper footwear; avoiding icy, slippery conditions;

watching out for hazards on the floor; and lifting less.

An additional behaviour change was an increase in the discussion of osteoporosis. Better informed as a result of the course, participants reported asking more questions of their health professionals. Discussion of osteoporosis increased among participants' family and friends. All participants reported sharing some aspect of the course with others. Some referred people to the course while others lent out the course book. Family members were encouraged to take preventative measures against osteoporosis.

Self-Efficacy

Results of the quantitative study showed that those who participated in the OPSMP reported increases in their confidence to manage activities that help prevent and/or manage osteoporosis. The group with osteoporosis felt more confident in being able to: walk at a moderate pace for 30 minutes, ask their doctor about hormone replacement therapy, carry out activities that would reduce the possibility of having a fall, manage their symptoms to continue to do the things they enjoyed doing, deal with the frustrations caused by osteoporosis, and keep discomfort from interfering with their sleep.

The group of persons who did not have osteoporosis felt more confident in being able to: ask their doctor about hormone replacement therapy, do something to feel better if they were feeling down, and to continue most daily activities.

The findings from the qualitative survey are consistent with those found in the pre- and post-program questionnaires. Participants reported changes in their perceptions of their capability to have some control over the development of osteoporosis. That is, many learned that osteoporosis did not have to be "inevitable" for some people. A number of participants were not aware that osteoporosis could be prevented and were critical of the health care system for failing to bring this to their attention. Because of the information that activities such as ensuring adequate calcium intake and engaging in consistent exercise could have some benefits in preventing and managing osteoporosis, participants felt more resolute about doing these activities and felt confident that they were carrying out the appropriate activities by following the guidelines in the course.

Health Beliefs

There were significant changes in persons who took the OPSMP. Study results show that there were statistically significant changes in three of the five subscales of the

Osteoporosis Health Belief Scale. Specifically, six months after they participated in OPSMP participants: had increased their perception regarding the severity of osteoporosis, had stronger beliefs regarding the benefits of exercising and increasing their calcium intake, and had stronger motivation to stay healthy.

Pain, Perceived Health Status, and Quality of Life

The results show that OPSMP participants felt that their health status had improved as a result of the program and that they had a higher quality of life.

Additional Participant Feedback

In the qualitative study, participants identified two areas they believed should be addressed in future programs. They particularly liked the group process and in some communities the groups continued to meet as "support groups" following the end of the program. As well, from the comments of participants, three recommendations for future programs could be determined.

Participants frequently mentioned the benefits of the group process and the mixture of ages and persons with and without osteoporosis.

"It was especially insightful to have a group of mixed ages, including those with and without osteoporosis, to learn the concerns at both ends."

"... sitting right next to an older woman who had sustained a fractured vertebrae from putting a 20 pound turkey in the oven blew my mind! Definitely instilled motivation to pursue a preventative approach to aging process."

The value of having a group leader with osteoporosis was mentioned.

"My instructor has been an excellent example into how lifestyle changes can improve your quality of life and reduce fracture risk due to osteoporosis."

The formation of support groups by OPSMP participants was not monitored during the project period, but this was mentioned by several of those interviewed post-program. Participants reported that they were still meeting together even after the program had concluded. They appreciated the "support" from the members and the sharing of information

and experiences.

"The course brought together a group of us with similar problems... besides the exchange of ideas, information etc. we were a great support to one another."

Recommendations

First of all, implementation statistics demonstrate that OPSMP is both a feasible and viable community outreach program. The results of the evaluation studies (both quantitative and qualitative) have shown that both people with and without osteoporosis benefitted from the program. Therefore, it is recommended:

1. **That the program continue to be offered to the general population.**

People with osteoporosis tended to be older and of a different occupational status than people without osteoporosis who were younger and more involved in the work force. These factors suggest that implementation strategies be different for the two groups. Therefore, it is recommended:

2. **That the OPSMP course be re-designed to focus on two populations - people without osteoporosis, and people with osteoporosis.**

A consistent theme from the qualitative studies was that the program should be available to women of younger ages, especially teenagers. Therefore, it is recommended:

3. **The OPSMP be targeted to young adults, especially adolescent women.**

Conclusion

Overall, the evaluation showed that the OPSMP was highly successful in introducing participants to the concepts of self-management and to knowledge about osteoporosis. The result is that at-risk populations will take preventive action and those with osteoporosis will adopt behaviours that helps them manage the condition and which reduces the morbidity of the condition.

REFERENCES

- Bandura, A. (1986). Social foundations of thought and action: A social cognitive theory. Englewood Cliffs, NJ: Prentice-Hall.
- Bandura, A. (1991). Self-efficacy mechanism in physiological activation and health-promoting behaviour. In J. Madden (Ed.), Neurobiology of learning, emotion and affect (pp. 229-269). New York: Raven Press.
- Dixon, J., & Bird, H. (1981). Reproducibility along a 10 cm vertical analogue scale. Annals of Rheumatic Diseases, 40, 87-89.
- Downie, W., Letham, P., Rhind, V., Wright, V., Branco, J., & Anderson, J. (1978). Studies with pain rating scales. Annals of Rheumatic Diseases, 37, 378-381.
- Janz, N. K. & Becker, M. H. (1984). The health belief model: A decade later. Health Education Quarterly, 11, 1-47.
- Kim, K. K., Horan, M. L., Gendler, P., & Patel, M. K. (1991). Development and evaluation of the Osteoporosis Health Belief Scale. Research in Nursing and Health, 14, 155-163.
- Revill, S. I., Robinson, J. O., Rosen, M., & Hogg, M. I. J. (1976). The reliability of a linear analogue for evaluating pain. Anaesthesia, 31, 1191-1198.
- Scott, J., & Huskisson, E. C. (1979). Accuracy of subjective measurements made with or without previous scores: An important source of error in serial measurement of subjective states. Annals of the Rheumatic Diseases, 38, 558-559.
- Stewart, A. L., Hays, R. D., & Ware, J. E. (1988). The MOS short-form general health survey: Reliability and validity in a patient population. Medical Care, 26, 724-735.
- Turk, D. C., Meichenbaum, D., & Genest, M. (1983). Pain and behavioural medicine: A cognitive-behavioural approach. New York: Guilford Press.
- Ware, J. E., Nelson, E. C., Sherbourne, C. D., & Stewart, A. L. (1992). Preliminary tests of a 6-item general health survey: A patient application. In A.L. Stewart and J. E. Ware (Eds.). Measuring Functioning and Well Being: The Medical Outcomes Study Approach. Durham, NC: Duke University Press.

LIST OF APPENDICES

Appendix A Leader's Manual

Appendix B Participant's Handbook

Appendix C UBC Ethical Approval

Appendix D Survey of Continuing Care Personnel in BC Health Units

Appendix E Consent Forms and Evaluation Questionnaires

Appendix F Qualitative Interview Questions

Appendix G Results of Qualitative Interviews

Appendix H Telephone Survey of Participants