The Health Benefits of a Physical Activity Program for Older Adults Living in Congregate Housing

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ABSTRACT

Background: In Saskatoon in 2002, as one of the key strategies for the *in motion* health promotion strategy, the *Forever... in motion* program was developed with the general goal of increasing opportunities for physical activity among older adults living in congregate housing. The three components of the program were a low-intensity exercise program, informal socialization and educational sessions. The objective of the present study was to examine whether participation in this program positively influenced participants' physical, emotional, psychological and social well-being.

Methods: A quasi-experimental, pretest/post-test design was employed to examine the impact of the program on various aspects of participant well-being. Thirty-six program participants and a comparison group of 22 non-participants from two congregate housing facilities took part in the study. The pretest was administered to the study and comparison groups before or shortly after the 12-week session commenced, and the post-test was administered after the 12-week session had concluded. Pretest and post-test assessment consisted of self-report measures of 1) vitality, 2) self-rated health, 3) mental health, 4) social functioning, 5) role limitations due to emotional problems, 6) physical activity-related knowledge, and 7) self-efficacy for exercise. A multivariate analysis of covariance (MANCOVA) was conducted using the seven post-test scores as dependent variables and the pretest scores as covariates.

Results: After adjusting for differences in baseline characteristics, the findings revealed statistically significant improvements in self-reported health and self-efficacy for exercise in the program participant group as compared with non-participants.

Conclusion: The results of this study suggest that a relatively low-cost, low-intensity exercise program such as the *Forever...in motion* program may positively influence the well-being of older adults living in congregate housing. However, additional research with a larger number of participants and a more rigorous study design is needed to further elucidate the health benefits of the *Forever... in motion* program.

Key words: Exercise; aged; health promotion

La traduction du résumé se trouve à la fin de l'article.

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In Canada in 2001, the economic burden associated with physical inactivity was estimated at 5.3 billion dollars.¹ Many studies have demonstrated the benefits of physical activity for older adults.^{2,3} However, recent research suggests that 60%-70% of older Canadians are sedentary.^{2,4,5} The number of seniors is growing rapidly in Canada.⁶ Physical activity programs for older adults with demonstrated effectiveness are desperately needed.^{5,7,8}

In Saskatoon, Saskatchewan in 2002, as one of the key strategies for the *in motion* health promotion strategy, the *Forever... in motion* program was developed with the general goal of increasing opportunities for physical activity among older adults living in congregate housing.* To date, however, a formal evaluation of how successful the *Forever...in motion* program has been in enhancing the well-being of its target group has not been conducted. Therefore, the purpose of this research was to investigate whether participation in the *Forever...in motion* program had improved the physical, emotional, psychological and social well-being of older adults living in congregate housing facilities.

METHODS

Target population

Two of the 22 congregate housing facilities involved in the *Forever...in motion* program participated in the present study. One of the facilities (Site 1) is located in a central, lower-income area of Saskatoon that is in close proximity to a number of retail services. The second site (Site 2) is situated near a middle-class residential area and is located within close proximity to a health facility, church and shopping mall.

Within the two housing facilities, the target population was sedentary older adults who had a sufficient health and fitness level to be regular participants in a physical activity program. Eligibility criteria for participants included being: 1) 65 years of age or older, and 2) free of cardiovascular disease, stroke or severe musculoskeletal problems that would prevent one from participating in a physical activity program (based on referral from the facility administrator). The study was approved by the University of Saskatchewan Behavioural Research Ethics Board.

* Congregate housing facilities offer independent living in separate apartments and opportunities to share activities of daily living with others, as one chooses.

To recruit participants, notices of the study were posted in common areas throughout the housing facilities. The first author also made contact with residents by regularly attending various social events in the buildings (e.g., afternoon coffee time, bake sales). Tenants who expressed an interest in participating were provided with a letter that explained the study in detail and individual appointments were then made to provide further explanation. Residents who expressed interest in participating and who met the eligibility criteria were asked to participate in the study. Residents who wanted to participate in the program, but who did not wish to take part in the evaluation of the program, were free to do so. The majority of comparison group participants were recruited by personal contact during social events at the facilities. Both facilities contributed participants to the study and comparison groups.

The intervention

Bandura's Social Learning Theory provides the guiding framework for the *Forever...in motion* program.^{9,10} This theory proposes that the ability to make behavioural changes is based on one's perceived level of confidence that has been developed from previous experiences. The program attempts to enhance participants' self-efficacy for exercise by: 1) encouraging participants to be successful and recognizing the small, incremental behavioural changes that have been made; 2) helping participants identify strategies to prevent a discontinuation of the program; 3) providing an opportunity for peer support and to exercise with a group of peers; and 4) disseminating information on the risks of a sedentary lifestyle and the benefits of exercise.^{9,10}

The three components of the program were a low-intensity exercise program, informal socialization, and educational sessions. The exercise classes were held once a week at Site 1 and twice a week at Site 2. Two community volunteers, trained by the Red Cross *Link to Health Program*,¹¹ provided the exercise instruction. Each class was approximately 60 minutes in length. To address the physical challenges of participants, an adaptable exercise program was utilized (e.g., a chair was used to provide support during balance exercises). Each session, which varied in length

depending on the capability of the participants, included: a warm-up, aerobic exercises, strength and endurance exercises, balance activities, stretching exercises and a cool-down.

Opportunities for informal socialization between participants existed at each facility, and included gathering together for visiting following each session. Educational sessions were also encouraged at each of the research sites. However, only Site 2 agreed to participate in a formal group that provided information on the amount and type of physical activity necessary to achieve a health benefit. Therefore, at that site, information was provided by the first author in a more informal way during visits to the exercise classes.

Study design

Because conducting a randomized controlled study was not considered feasible, a quasi-experimental, pretest/post-test design was used to examine the impact of the *Forever...in motion* program on participants' well-being.¹² The figure below illustrates this design in symbols:

$$\begin{array}{l} \text{NR pretest } X \text{ post-test (Study Group)} \\ \text{NR pretest } \frac{\quad}{\text{post-test}} \text{ (Comparison Group)} \end{array}$$

Note: NR=non-random assignment
X = exercise intervention

The pretest was administered to the study and comparison groups before or shortly after the 12-week session commenced, and the post-test was administered after the 12-week session had concluded. In the majority of cases, the pretest and post-test were administered to groups of approximately four tenants. However, on several occasions, the surveys were administered individually to accommodate the tenants' schedules.

At the pretest and post-test, study participants were administered seven self-report measures of well-being. Five of these measures – vitality, mental health, general health, social functioning, and role limitations due to emotional problems – were measured by the *Short-Form SF 12*.¹³ The test-retest reliability for the *SF 36* scales range from .65 to .87 and the internal consistency range from .80 to .92.¹⁴ The *SF-12* has been found to be comparable to the *SF 36*¹⁵ and to be a reliable instrument for

community-dwelling older populations.¹³ For each *SF 12* subscale, items were summed, with higher scores indicating more positive health (e.g., functioning is scored so a higher score indicates better functioning, whereas pain is scored so that a higher score indicates less pain).

Self-efficacy for exercise was assessed by the *Self Efficacy Scale*, a 5-item measure that asks participants to rate their level of confidence in taking part in regular exercise in various conditions (e.g., when tired, during vacation, during bad weather). In previous research, test-retest reliability was 0.90 over a two-week period.¹⁶ Scores were summed, with higher scores indicating more confidence in pursuing physical activity.

Finally, physical activity-related knowledge was measured by Morrow and Hui's *Knowledge of Physical Activity Scale*, which assesses participants' knowledge regarding: 1) the appropriate frequency, intensity and duration of physical activity needed to achieve health benefits; 2) physical activity's effect on specific diseases; and 3) the types of physical activity which provide health benefits.¹⁷ This scale was scored by giving one point for a correct answer and then summed. Higher scores indicated more knowledge.

Analysis

To determine the baseline similarity of the study and comparison participants, socio-demographic characteristics and pretest scores on all the dependent variables were compared using chi-square and t-tests. A multivariate analysis of covariance (MANCOVA) was conducted using the seven post-test scores as dependent variables and the corresponding pretest scores as covariates.¹⁸ The independent variable was group membership (study vs. comparison).

RESULTS

Characteristics of the study sample

Of the 179 congregate housing residents identified as potential participants in the study, 61 (33%) agreed to participate in the study. Participation rates were similar for both sites. Of the 61 residents initially agreeing to participate in the study, 58 (36 in the study group and 22 in the comparison group) completed pretest and post-test measures. Within the study group, the

majority of participants attended at least 60% of the exercise classes offered (Table I).

The study and the comparison groups were similar in age, marital status, education, gender, and financial status (Table II). For the pretest measures, however, the study group scored significantly higher than the comparison group on measures of vitality, self-efficacy for exercise, social functioning, and mental health (Table III).

Data from individuals providing complete information for all pretest and post-test measures were used in the MANCOVA. No statistically significant socio-demographic differences were found between those participants who provided complete information and those with missing data. To examine the assumption of multivariate homogeneity of variances and covariances, the Box's M test was performed. Results indicated that the assumptions were not violated, Box's M = 39.09, $F= .96$, $p=0.53$. Further, the Bartlett's test of sphericity indicated that the MANCOVA was justified given the intercorrelation among the dependent variables, $\chi^2(27) = 142.13$, $p<0.05$. Using Wilks' criterion, the multivariate F for group membership was statistically significant, Wilks' $\lambda=0.38$, $F(7,15)=3.58$, $p=0.02$. Subsequent ANCOVAs revealed that, at post-test, the study group scored significantly better than comparison participants on self-efficacy for exercise and self-rated health, after adjusting for pretest scores (Table IV). No other statistically significant differences emerged at post-test.

DISCUSSION

The objective of the present study was to determine whether participation in the *Forever...in motion* program improved participants' physical, emotional, psychological and social well-being. A three-month evaluation period was chosen based on studies that indicated beneficial health outcomes were possible within this timeframe.^{8,19-21} Consistent with these previous findings, the results of the present study indicated a statistically significant improvement in participants' perceived self-efficacy for exercise following the 12-week exercise program. In the research literature, self-efficacy has been identified as a causal mechanism, effective in influ-

TABLE I

Number of Study Group Participants Attending Exercise Classes, by Site

	Attended Less Than 60% of Classes	Attended 60-79% of Classes	Attended 80-100% of Classes	Total
Site one	2	5	5	12
Site two	5	14	5	24
Total	7	19	10	36

TABLE II

Comparison of Homogeneity of Socio-demographic Characteristics Between Study and Comparison Groups Before Exercise Intervention

	Study Group		Comparison Group		p*
	Number	%	Number	%	
Gender					
Male	8	22.2	5	22.7	0.96
Female	28	77.7	17	77.3	
Age (years)					
60-71	10	27.8	4	18.2	0.58
72-79	10	27.8	5	22.7	
80-85	11	31.0	7	31.8	
≥86	5	13.9	6	27.3	
Educational Attainment					
Elementary	14	42.4	11	50.0	0.84
High School	15	45.5	9	40.9	
College/university	4	12.1	2	9.1	
Marital Status					
Married	18	50.0	6	27.3	0.09
Widowed/divorced/never married	18	50.0	16	72.7	
Annual Income					
≤\$20,000	14	51.9	12	75.0	0.13
>\$20,000	13	48.1	4	25.0	

* Fisher exact probability tests were used in cases where the smallest expected frequency was less than five, otherwise chi-square tests were used to determine statistical significance.

TABLE III

Pretest Scores on Health Measures by Group

	Study Group		Comparison Group		p
	Mean	Standard Deviation	Mean	Standard Deviation	
Vitality	3.69	1.22	2.91	1.14	0.02
Self-rated health	3.12	0.97	2.64	0.98	0.07
Mental health	9.68	2.06	8.46	2.02	0.03
Social functioning	5.00	1.41	4.14	1.52	0.03
Role limitations due to emotional problems	0.47	0.72	0.85	0.93	0.10
Physical activity knowledge	6.14	1.68	6.05	1.41	0.84
Self-efficacy for exercise	14.42	9.94	10.94	4.79	0.02

TABLE IV

Summary of the Univariate ANCOVAs* on Post-test Adjusted Means†

	Group Estimated Marginal Mean (SE)‡		F	p
	Study Group	Comparison Group		
Vitality	4.08 (.32)	3.13 (.45)	2.26	0.15
Self-rated health	3.36 (.16)	2.52 (.23)	6.95	0.02
Mental health	10.08 (.41)	8.95 (.59)	1.91	0.18
Social functioning	4.87 (.25)	5.41 (.35)	1.25	0.28
Role limitations due to emotional problems	0.37 (.16)	1.00 (.22)	4.05	0.06
Physical activity knowledge	7.09 (.26)	6.75 (.37)	.43	0.52
Self-efficacy for exercise	17.65 (1.02)	11.97 (1.46)	7.83	0.01

* Analysis of covariance

† Means are adjusted for pretest scores on a given dependent variable

‡ Standard error

encing a number of health behaviours, including physical activity.²² With respect to older adults, studies have found that individuals with greater levels of self-efficacy are more likely to engage in physical activity,²³ and report better physical and mental health.⁸ Increased levels of confidence also appear to be generalizable to the other

areas of an older person's life that require some degree of physical activity.²⁴ Our results also revealed a statistically significant improvement in the self-reported health of study participants compared to the control group. Precisely what is being captured by these global self-ratings of health, such as the one used in the present

study, has yet to be determined;²⁵ nonetheless, more positive assessment by seniors of their health has been consistently associated with a variety of desirable health outcomes, including lower mortality rates, lower self-reported disease, and better physician-assessed health status.²⁶⁻²⁸

Although the findings of the present study do suggest that participation in the *Forever...in motion* program did enhance some important aspects of older adults' health, there are several important study limitations that must be considered when interpreting the results. First, given the low response rate, the presence of selection bias is a major concern. Second, all measures were self-reported, thus reporting biases cannot be ruled out. Third, the small sample size not only reduced the power of the study, but also precluded our ability to examine more nuanced relationships among various subgroups of study participants (e.g., by facility or by gender). Finally, even though several statistically significant findings did emerge, attributing these positive changes solely to the exercise intervention would be inappropriate, given the quasi-experimental study design employed.²⁹ Although the presence of a control group provided a baseline of comparison to interpret the effectiveness of the intervention, the lack of random assignment to the study and comparison group dictates caution when interpreting the findings.

CONCLUSIONS

The results indicated statistically significant improvements in self-efficacy for exercise and self-rated health after participating in the *Forever...in motion* program. This study suggests that a practical, low-cost and convenient physical activity program may improve some aspects of well-being among older adults. However, additional research with a larger number of participants and a more rigorous study design is needed to further elucidate the potential health benefits of the *Forever...in motion* program.

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RÉSUMÉ

Contexte : Le programme *Forever... in motion* était l'un des éléments clés de la stratégie de promotion de la santé *in motion* implantée en 2002 à Saskatoon. Globalement, le programme visait à accroître les possibilités d'activité physique offertes aux personnes âgées vivant dans des habitations collectives. Il comportait trois volets : un programme de conditionnement à faible impact, une socialisation informelle et des séances de sensibilisation. Nous avons voulu déterminer si la participation à ce programme a eu une influence positive sur le bien-être physique, affectif, psychologique et social des participants.

Méthode : Nous avons employé une méthode pré-test/post-test quasi expérimentale pour analyser l'incidence du programme sur divers aspects du bien-être. Trente-six participants au programme et un groupe témoin de 22 non-participants ont été recrutés dans deux habitations collectives. Le pré-test a été administré au groupe des participants et au groupe témoin avant ou peu après le début de la session de 12 semaines. Le post-test a été administré après la fin des 12 semaines. L'évaluation pré- et post-test comportait des mesures autodéclarées : 1) de la vitalité, 2) de l'état de santé auto-évalué, 3) de la santé mentale, 4) des relations sociales, 5) des contraintes dues à des troubles affectifs, 6) des connaissances sur l'activité physique et 7) de l'auto-efficacité par rapport au conditionnement physique. Nous avons effectué une analyse multivariée de la covariance (manova) en utilisant les sept scores au post-test comme variables dépendantes et les scores au pré-test comme covariables.

Résultats : Après les ajustements nécessaires pour tenir compte des écarts dans les caractéristiques de base, nous avons noté des améliorations significatives de l'état de santé auto-évalué et de l'auto-efficacité par rapport au conditionnement physique dans le groupe des participants au programme, comparés aux non-participants.

Conclusion : Un programme d'activité physique à faible intensité et relativement peu coûteux, comme *Forever... in motion*, pourrait positivement influencer le bien-être des personnes âgées vivant dans des habitations collectives. Pour déterminer avec précision les avantages pour la santé de *Forever... in motion*, il faudrait pousser la recherche en recrutant un plus grand nombre de participants et en resserrant la méthode de l'étude.

Mots clés : conditionnement; aînés; promotion de la santé

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PREVENT, PREPARE for and PROTECT YOURSELF from the next FLU PANDEMIC

The Canadian Public Health Association (CPHA) and the Pandemic Health Alert Network are informing Canadians about the basic public health steps we can all take to help prevent the spread of infection, prepare to cope in an emergency, and protect our health during a flu pandemic.

Around the world, governments are gearing up for the next flu pandemic. Websites, fact sheets and checklists abound. However, the language they use and level of information they provide can be overwhelming and technical. To address this, CPHA and the Pandemic Health Alert Network have created a toolkit of practical, evidence-based information that is communicated in plain language.

This simple and practical toolkit provides Canadians with the information they need to protect themselves in a flu pandemic. The tools are easy to use, with common sense measures Canadians can put into practice in their daily lives.

These simple public health steps fall into three action areas:

1. **PREVENT** – basic public health habits that reduce the chance of catching and spreading the flu, such as proper hand washing;
2. **PREPARE** – easy-to-follow instructions on how to be prepared for a flu pandemic, or other emergency situation; and
3. **PROTECT** – crucial information on self-care during a flu pandemic.

The toolkit is designed to stimulate Canadians' interest to learn more and put that knowledge into action with simple measures that could stem the force of the next flu pandemic. The hope is that these steps will strengthen public resilience. That way we'll all be better prepared to cope in a flu pandemic, or other public health emergency.

The toolkit is available in English and French, online at www.pandemic.cpha.ca.