



Evaluation of the Home Support Exercise Program in Sudbury and Manitoulin

Final Report

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Executive Summary

In late 2009, funding for new comprehensive, community-based falls prevention initiatives was provided in Sudbury and districts through the North East Local Health Integration Network (NE LHIN) under the Aging at Home Strategy. This capacity-building project provides an opportunity to coordinate current falls prevention services being offered within the City of Greater Sudbury and the Sudbury and Manitoulin districts. As part of this initiative, eight home support service providers in the Sudbury and Manitoulin districts were funded to implement the Home Support Exercise Program (HSEP) for their clients.

The HSEP is an evidence-based physical activity intervention delivered through home support agencies. It targets hard-to-reach seniors living in the community who are at high risk for loss of functional independence. The program includes “10 simple yet progressive exercises” designed to enhance and maintain functional fitness, mobility, balance, and independence for seniors.

The Sudbury & District Health Unit led the evaluation of the HSEP implementation in the Sudbury and Manitoulin districts. The evaluation of the HSEP was both a process and an outcome evaluation. The purpose of the evaluation of the HSEP was to identify the facilitators and barriers to the implementation of the program, to determine if the planned activities have had the desired impact on the target populations, to measure progress, and to inform planners about the development and implementation of future falls prevention strategy workplans.

Data for the outcome evaluation were collected in two waves. The first wave included 154 clients from the eight agencies in which the HSEP was implemented. The second wave included 93 clients from five agencies, two of which were different from the first wave. The intermediate outcome of the HSEP was evaluated by comparing data from clients both before and after the eight-week program period, using two different instruments: the *Falls Efficacy Scale (FES)*, a measure of the client’s fear of falling during essential, non-hazardous daily activities, and the *TUG Test*, a measure of the client’s mobility.

Following the first wave of data collection and analysis of client outcomes, it was determined that the program evaluation would benefit from an assessment of the factors influencing those outcomes including client perceptions of the program, environment, context, and program implementation. A process evaluation, which consisted of key stakeholder interviews with representatives from eight provider agencies and post-intervention follow-ups with 44 clients, was also carried out.

Results—Process Evaluation

Interviews with key stakeholders from the provider agencies revealed that the HSEP was delivered in one of two different manners: on an individual level in the home, which is the way the program is

Executive Summary

intended to be delivered, and in a group format. Key stakeholders identified challenges with identification of suitable clients for the HSEP, and with training of personal support workers.

Based on findings from both the key stakeholder interviews and the client surveys, we can conclude that the staff who deliver the program are essential to making the HSEP work. Ongoing encouragement and support from the personal support worker or team leader is an important facilitator to continued participation in the program. In instances where clients felt there was insufficient support or follow-up, completion rates of the program were much lower. The motivation of improved mobility, balance, and function is also a very important facilitator, and should be used to “sell” the program to potential participants.

A number of reasons for non-completion of the program by the client were identified. Some clients were unable to do the exercises for physical reasons, including pain or injury. Other clients became ill or went to the hospital. A small number of clients were discharged from the Community Care Access Centre (CCAC) and subsequently lost to follow-up. Others were not interested in participating after the initial demonstration and therefore chose not to complete the program.

The program is very well received by agencies and most wish to continue with program delivery. The program is also well received by clients, who, for the most part, feel the program meets their needs. It is also encouraging to note that almost half of the participants were continuing to do the exercises even after the completion of the program. Agencies appreciate that the HSEP is an evidence-based program, that the exercises are easy to do, and that there is good structure to the program.

Results—Outcome evaluation

Baseline data was collected in two waves from a total sample of 247 individuals. Post-intervention data were obtained from 160 (64.8%) of the 247 clients captured at baseline. Clients came from 10 different participating agencies. A large majority (84.8%) were classified as being at risk for falling.

The results appear to demonstrate a small yet significant improvement among clients following implementation of the program. On average, clients who completed the program achieved a 2.1 second improvement in their TUG Test results, which is statistically significant. More than half of the clients who completed the program saw their TUG test results improve from baseline, most by between 1 and 10 seconds. As well, overall client confidence appeared to improve for all of the components of the Falls Efficacy Scale (FES), though this improvement was statistically significant for only 4 of the 10 components.

Improvement in mobility was more pronounced among clients with poorer baseline TUG Test scores. The level of improvement in mobility varied by participating agency, and these differences persisted after adjusting for other client characteristics. The differences may be related to how the program was delivered, or to other explanatory factors not captured in the analysis. The differences do not appear to be related to delivery of the program in a group vs. an individual setting.

Clients who were at risk for falling had larger improvements in mobility on average, though this effect appears to be explained by other factors. Linear regression analysis revealed a significant interaction between the data collection wave and baseline TUG Test score. While having a poorer

baseline TUG Test increased a client's improvement in TUG Test results on average, this effect was significantly more pronounced in the second data collection wave. This may be due to changes in the implementation of the program between the two waves. A greater effort was made in the second wave to obtain a high rate of completion of the post-intervention tests, which likely focused on higher risk/lower mobility clients (who had a higher rate of drop-out during the first wave).

The lack of a comparison group limits our ability to attribute the observed improved client outcomes to the implementation of the program. To the best of our knowledge, there were no changes in the clients' environment that may have otherwise led to their improved results in the absence of the intervention, although data was not collected on the environment. It is reasonable to conclude that the exercise program was responsible for at least some of the observed improvement.

Conclusion and Implications for Practice

The findings of this evaluation demonstrate that participation in the Home Support Exercise Program (HSEP) is associated with a small yet statistically significant improvement in client confidence and mobility. The program appears to be especially effective among higher risk clients—those with lower mobility at baseline.

These findings provide support for the broader implementation of the HSEP among older adults locally, as a means to help them maintain their health and functional independence, and to lower their risk for falls and fall-related injuries.

There are a number of items that need to be considered; however, with broader implementation of the HSEP. These include appropriate processes to properly identify suitable clients for the program, and provision of ongoing encouragement and support for continuation of the exercises. These strategies could help mitigate some of the physical limitations that are an important barrier to completion of the program, and could help with increasing client interest in the program. Ensuring consistency with the support worker is also important since this person plays such a key role in clients continuing the program. It may also be valuable for personal support worker and other support workers who are working on this program to have an opportunity to share lessons learned and approaches that have been successful with clients.

It may also be valuable to further explore the instances where the program is being offered to groups of individuals. The original intent of the HSEP is for delivery to individuals in the home. There is another program, Stand Up!, which is intended for group delivery with more mobile seniors. It would be important to determine what, if any overlap there is, with the delivery of HSEP in a group setting and Stand Up!

Overall, the results of this evaluation are supportive of the continuation of the HSEP Program in Sudbury and Manitoulin districts. The program has been well received by the community, and the agencies that work with the older adult population in the SDHU catchment area are continuing to offer this important program to their clients.

Context

In late 2009, funding for new comprehensive, community-based falls prevention initiatives was provided in Sudbury and districts through the North East Local Health Integration Network (NE LHIN) under the Aging at Home Strategy. This capacity-building project provides an opportunity to coordinate current falls prevention services being offered within the City of Greater Sudbury and the Sudbury and Manitoulin district. The Sudbury & District Health Unit (SDHU) has a lead coordinating role in this project, but works closely with a steering committee comprised of key partner agencies, namely, Centre de santé communautaire du Grand Sudbury, Canadian Red Cross, Health Sciences North/Horizon Santé-Nord, North East Community Care Access Centre (NE CCAC), and the North East Specialized Geriatric Services, to design and implement the yearly workplan.

An evaluation plan for the key activities that were implemented as part of the SDHU's 2010–2012 Falls Prevention Strategy was developed. The purpose of the evaluation was to help guide the planning and development of future Falls Prevention Strategy workplans.

This report presents the findings of the evaluation of the Home Exercise Support Program (HSEP), which is one component of the Falls Prevention Strategy. The goal of the evaluation of the HSEP was to assess the program implementation process and to determine whether the program was effective in improving client outcomes. Results from this evaluation will aid in identifying considerations for improvement of future interventions.

The Home Support Exercise Program

Description of the Program

In 1996, the Canadian Centre for Activity and Aging (CCAA) developed the Home Support Exercise Program (HSEP), an evidence-based physical activity intervention delivered through home support agencies. It targets hard-to-reach seniors living in the community who are at high risk for loss of functional independence. The program includes “10 simple yet progressive exercises” designed to enhance and maintain functional fitness, mobility, balance, and independence for seniors. It is designed to be delivered in the home. Results suggest that this program is effective and beneficial in improving the physical and psychosocial well-being of the frail homebound elderly population (Johnson et al. 2003; Tudor-Locke et al., 2000).

The 10 exercises in this program are intended to help individuals maintain or improve their endurance, balance, strength, and flexibility. Program participants spend approximately one hour with an instructor who teaches the exercises and who provides diagrams describing them. These exercises are generally done standing and include walking on the spot or from room to room: push-ups from a wall; rising up and down on your toes; toe taps; seat walks; getting up from a chair; leg lifts front, back, and side; reaching with your arms and stretching activities.

Participants are asked to do the exercises over a period of eight weeks, and are encouraged to do them on a daily basis, to the extent that they are able to tolerate the activity level. It is expected that participants will build up the frequency and intensity of the exercises based on individual capacity.

Johnson et al. (2003), reported that the HSEP is the first home-based exercise program in which the home-care infrastructure constitutes the vehicle for both recruitment and delivery. Most empirically examined home-based exercise interventions to date have focused on healthy older adults (Atienza, 2001). The HSEP differs from prior interventions in several important respects: not requiring additional participant-recruitment strategies, not requiring participant transport or equipment, not requiring additional visits from specialized health professionals, and having built-in mechanisms for monitoring and ongoing support through regular home-care visits (Tudor-Locke et al., 2000).

The HSEP is an evidence-based program. It has been evaluated in the past using a variety of methods related to various desired outcomes. For instance, the Alberta Centre for Active Living partnered with the CCAA to disseminate the program across Alberta (Alberta Centre for Active Living, 2006). A pilot project using surveys as the primary data collection tool made it possible to identify strengths and weaknesses in implementing the program (Alberta Centre for Active Living, 2006). The Falls Intervention Team (FIT) project (2005–2006)—a community-based

The Home Support Exercise Program

interdisciplinary, multi-faceted falls prevention strategy for frail community-dwelling older adults—implemented the HSEP as a part of the standardized FIT protocol (i.e. five home visits plus one telephone call delivered over a three-month period). In a study by Sipe (2009), the evaluation process utilized a case study approach, employing interviews and focus groups to obtain reactions to all aspects of the program—training, delivery, exercise adherence, and assessment. Other methods used to assess the program successes and challenges include analysis of the pre- and post-intervention scores for the Falls Efficacy Scale (Tinetti, Richman and Powell, 1990) and the TUG Test (Alberta Centre for Active Living, 2006; Johnson, 2003), the latter having been analysed by risk, demographics, and health status (Johnson, 2003).

Implementation of the Program in Sudbury and Manitoulin Districts

In 2009, funding was provided for eight home support service providers in the Sudbury and Manitoulin districts to implement the HSEP for their clients. Participating agencies were the Alzheimer's Society Sudbury-Manitoulin, Bayshore Home Health, Centre de santé communautaire du Grand Sudbury, Comcare Health Services, Canadian Red Cross, Retire at Home Services, Sudbury East Seniors Support, and Ukrainian Seniors Centre. The SDHU provided training opportunities to the participating agencies' health care aids such that they could incorporate HSEP into their home support services. The SDHU also led the evaluation of the HSEP implementation in the Sudbury and Manitoulin districts, the findings of which are presented in this report.

Evaluation of the Program in Sudbury and Manitoulin Districts

The evaluation of the HSEP was both a process evaluation and an outcome evaluation. The purpose of the evaluation of the HSEP was to identify the facilitators and barriers to the implementation of the program, to determine if the planned activities have had the desired impact on the target populations, to measure progress, and to inform planners about the development and implementation of future Falls Prevention Strategy workplans. The outcome evaluation of the HSEP focused mainly on intermediate outcomes of the Falls Prevention Strategy.

Outcome Evaluation

Data for the outcome evaluation were collected in two waves. The first wave included 154 clients from the eight agencies in which the HSEP was implemented. The data collection period was from mid-November 2010 until March 31, 2011. The average time between an individual client's pre and post measurements was 8.6 weeks. The second wave included 93 clients from five agencies, two of which were different from the first wave. The data collection period was from September 2011 until May 2012 and the average time between an individual's pre and post measurements was 8.7 weeks.

The intermediate impact of the Home Exercise Support Program (HSEP) was evaluated by comparing data from clients both before and after the eight-week program period, using two different instruments:

1. the *Falls Efficacy Scale* (FES), a measure of the client's fear of falling during essential, non-hazardous daily activities (Tinetti, Richman and Powell, 1990)
2. the *TUG Test*, a measure of the client's mobility (Alberta Centre for Active Living, 2006; Johnson, 2003)

**Please refer to Appendix A for a description of these evaluation tools*

Other data collected included the client's age, sex, participating agency, and baseline fall risk assessment (Tudor-Locke et al., 2000).

Data were analysed using descriptive statistics, non-parametric statistical tests, and multiple linear regression. A small number of clients were excluded from analysis of the post-intervention results, due to their having implausible results (i.e. measurement error) or extreme values far outside what was typically observed (i.e. outliers)¹.

Process Evaluation

Following the first phase of data collection and analysis for the outcome evaluation of the HSEP, it was determined that the program evaluation would benefit from an assessment of the factors influencing client outcomes including client perceptions of the program, environment, context, and program implementation. A process evaluation was therefore also undertaken. This consisted of key stakeholder interviews with the provider agencies and post-intervention follow-ups with clients.

Key stakeholder interviews were conducted with eight representatives from provider agencies in March 2012. Interviews were conducted by telephone and lasted approximately 30 minutes. Stakeholders were asked to share insights into the process that their agency employed for implementing the program, to discuss their experiences with implementation, including challenges, and to provide some insights into why participants may or may not have completed the program. Data collected was summarized and analyzed thematically. Please refer to Appendix B for the interview guide.

In addition, an open-ended questionnaire was administered by telephone with clients in order to gain a better understanding of these variables as they relate to client outcomes and to the completion of the program and data collection. All clients who were registered in the second phase of data collection in HSEP (beginning in September 2011) were invited to participate in the follow-up telephone questionnaire between March and June 2012. The questionnaire results were compiled and analysed using descriptive statistics to gain a better understanding of client outcomes. The questionnaire that was administered can be found in Appendix C.

¹ Data were analysed using descriptive statistics for numeric variables and frequencies for categorical variables. As most numeric variables (i.e. age, risk, FES, and TUG) had a large degree of variation (i.e. high standard deviations relative to the mean), their distribution was further analysed by grouping them into categories.

Non-parametric statistical tests were used to test for significant differences between groups or across variables, as appropriate for the variable being considered. These included the Chi-Square and Fisher's Exact Test for categorical data analysis, the Mann-Whitney "U" Test for unmatched numeric data (2 groups), the Kruskal-Wallis one-way analysis of variance for unmatched numeric data (multiple groups), the Wilcoxon Sign-Rank Test for matched (pre-post) numeric data, and Spearman's Rank Correlation Coefficient (ρ) for linear correlation between two numeric variables.

Multiple linear regression was used to model the impact of a number of client baseline characteristics (i.e. age, sex, participating agency, risk, and baseline TUG test result) upon their change in TUG test result.

Results—Process Evaluation

The process evaluation consisted of two forms of data collection: key stakeholder interviews with representatives from the provider agencies and telephone interviews with program participants.

Key Stakeholder Interviews

The key stakeholder interviews revealed information on mode of program delivery, implementation of the program, and client reasons for non-completion of the program. Participants also made recommendations for future delivery of the program.

Program Delivery

Based on the interviews, we can determine that the HSEP program was delivered in one of two different manners depending on the provider agency. Most agencies delivered the program as intended: individuals were shown how to complete the exercises by a personal support worker, and then they completed the program individually over a period of eight weeks. The provider then followed up with the client at the end of the program period. In some cases, the personal support worker would remind the client to do the exercises, but this did not occur consistently. There are three agencies—the Alzheimer’s Society, Aide aux seniors, and the Ukrainian Seniors Centre—that chose to deliver the program in a group setting. It was identified that this social setting was valuable and that clients were more comfortable doing the exercises this way. However, it is important to note that this is not the way the HSEP is designed; it is designed to be an individual program delivered in the home.

Program Implementation

Key stakeholders were asked to speak about the implementation of the program within their agency. They identified specific challenges with client recruitment to the HSEP, and with training of personal support workers. It was noted that there are some challenges with identifying suitable clients for CCAC; however, the CCAC did indicate that they were planning on including the HSEP assessment as part of the overall intake so this would resolve many of these issues. The training of the personal support workers to deliver this program was seen as problematic for some agencies. There was a perception that the training time and associated costs were not covered by the program, although the implementation of the program in Sudbury and districts provided funding for this training.

The enthusiasm of the personal support worker or program leader is seen as key to making the HSEP work. Also, in cases where the personal support worker that trains the client to do the program is not the client’s regular worker, it seems less likely that there will be ongoing encouragement and reminders to do the program, thus affecting completion rates. It was recommended by some of the interview participants that it might be valuable to facilitate some form of cross-agency exchange so

that personal support workers or other program leads could share with others their insights about what works and how best to encourage clients to complete the program.

Reasons for Non-Completion of Program

A number of reasons for non-completion of the program by the client were identified by the provider agency representatives. Some clients were unable to do the exercises for physical reasons. Other clients became ill or went to the hospital. A small number of clients were discharged from the CCAC and subsequently were lost to follow-up. Others were not interested in participating after the initial demonstration and therefore chose not to complete the program.

Future Implementation of the Program

In general, all key stakeholders considered the program to be strong, meeting an important need, and putting onus on client—which is key to the design of the program. They appreciate the fact that it is an evidence-based program, that the exercises are easy to do, and that there is good structure to the program. Many agencies plan to continue on with the program even after the evaluation is complete. The integration of program intake into overall intake process at the CCAC will help better select clients.

The group settings seem to have more success at keeping people motivated. In this setting, the drop-out rates are very low. In some cases, the clients do the program every day with their group. However, the group sessions are different than how the program was intended to be offered; the evidence for the HSEP is for a self-led program, done independently. It is unclear to what extent group-led sessions conform to the program as designed. Participants who attend group programs tend to be more physically capable and many also live more independently. Therefore, carrying out the program in a group setting may preselect participants who inherently have higher physical ability. It also relieves the client of having to remember to do the exercises thus increasing compliance but with added time and cost for supervised implementation. Group settings seemed to have more success at keeping clients motivated, but in many ways, this is a different program.

Participant Surveys

Sample

A total of 44 clients from the second wave of data collection completed the telephone survey, which is a response rate of 51% (Table 1).

Table 1. Response Rate

Response Rate	Count
Number of respondents	44
Missing consents	21
Declined	8
Wrong Number	6
Did not understand/hard of hearing	3
Passed away or moved	2
Missing Number	1
Could not reach	2
Total	87

Most of the participants who completed the survey were female (82%) and the mean age was 79.2 (95% CI: 75.7, 82.5). The participants were asked to indicate the number of people living in their household, and more than two-thirds (68%) indicated living alone while just over a quarter (27%) indicated living with somebody. Of those who indicated living with somebody, 69% were living with their spouse/partner, 31% were living with their child/children and 16% did not specify with whom they were living (one respondent indicated they were living with both their spouse/partner and children).

Participants were asked if they had a fall or a near fall since they started the exercise program. Most of the participants (68%) indicated that they did not have a fall since the program commenced, while many of them indicated that they did have a fall (30%) and one respondent indicated having a near fall (Table 2).

Table 2. Falls Since Start of Home Support Exercise Program, SDHU, 2012

Fall	Count (n=44)	Percentage
Yes I had a fall	13	29.5%
Yes I had a near fall	1	2.3%
No	30	68.2%
Don't know/don't remember	0	0
Total	44	100%

Participant Experience

Almost all of the clients (98%) completed the Home Support Exercise Program in their home by themselves while one respondent did the exercises in both a group setting and individually.

When the participants were asked if they had completed the Home Support Exercise Program, half indicated having completed the eight-week program while 32% did not complete the program and 18% did not know or could not remember whether or not they had completed the program (Table 3).

Table 3. Completion of the Home Support Exercise Program, SDHU, 2012

Complete	Count (n=44)	Percentage
Yes	22	50%
No	14	31.8%
Don't know/don't remember	8	18.2%
Total	44	100%

Participants were asked to indicate how many days per week they did the exercises. Almost two-thirds (63.6%) of the group who completed the program did the exercises seven days a week, compared to less than half (45.5%) of those who did not complete (Table 4). Participants were also asked how many minutes it took them to do the exercises. Almost a quarter (22.7%) of those who completed the program spent 30 minutes on the exercises compared to only one of the participants that did not complete the program (Table 5). Those who did not complete the program were twice as likely to not remember how many days per week (18.2% for incompletes compared to 9.1% for completes) or how long it took them to complete the exercises (41% for incompletes compared to 22.7% for completes).

Table 4. Number of Days per Week Spent on Home Support Exercise Program by Completes, SDHU, 2012

Number of Days	Completes		Incompletes	
	Count (n=22)	Percentage	Count (n=22)	Percentage
Every day (7 days a week)	14	63.6%	10	45.5%
6 days	0	0.0%	2	9.1%
5 days	2	9.1%	1	4.5%
4 days	1	4.5%	2	9.1%
3 days	1	4.5%	1	4.5%
2 days	2	9.1%	2	9.1%
Don't remember	2	9.1%	4	18.2%
Total	22	100%	22	100%

* Note: those who indicated that they didn't know or didn't remember whether or not they had completed the program were counted as "incomplete".

Table 5. Minutes Spent on Home Support Exercise Program by Completes, SDHU, 2012

Number of Minutes	Completes		Incompletes	
	Count (n=22)	Percentage	Count (n=22)	Percentage
30 minutes	5	22.7%	1	4.5%
25 minutes	1	4.5%	1	4.5%
20 minutes	3	13.6%	3	13.6%
15 minutes	4	18.2%	4	18.2%
10 minutes	2	9.1%	3	13.6%
5 minutes or less	2	9.1%	1	4.5%
Don't remember	5	22.7%	9	41.0%
Total	22	100%	22	100%

Participants who did not complete the eight-week program were asked to indicate how many weeks they followed the program as well as the number of days per week and how many minutes they spent doing the exercises. Many participants (36%) could not recall how many weeks they participated in the Home Support Exercise Program while those who could recall, almost half (45%) reported following the program for 4 or 6 weeks.

Table 6. Incompletion of the Home Support Exercise Program, by Number of Weeks, SDHU, 2012

Number of Weeks	Count (n=22)	Percentage
2 weeks	1	4.5%
3 weeks	2	9.1%
4 weeks	5	22.7%
5 weeks	1	4.5%
6 weeks	5	22.7%
Don't remember	8	36.4%
Total	22	100%

Program Barriers and Support

The participants who did not complete the Home Support Exercise Program were asked to indicate the reasons why they did not complete it. Of those who provided a reason for not completing the program, the most common response was pain or injury experienced while doing the exercises (40%), followed by a lack of encouragement (15%), and personal illness (15%). Other reasons included lack of energy (14%); one participant also cited the inability to complete the exercises without help.

When participants were asked to indicate what had helped them complete the Home Support Exercise Program, many participants indicated improvements in mobility, balance, and function to be most helpful (41%). Others mentioned exercise instruction from a personal support worker, support from a health professional, and family support helped in the completion of the exercise program. Participants were also asked about the challenges they had encountered while following the program. More than half (55%) indicated a pre-existing injury and that some of the exercises were too painful, while a few others indicated that the exercises were too tiring (10%) or difficult (29%). Other factors that made it difficult for participants to do the program were the lack of support or follow-up, lack of ambition and that the exercises were too simple.

Participant Rating of the Program

Participants were asked to rate the extent to which the Home Support Exercise Program met their needs and expectations. The majority of participants indicated that it mostly or somewhat met their needs and expectations (30% and 32% respectively) (Table 7).

Table 7. Extent to Which the Home Support Exercise Program Met Needs and Expectations, SDHU, 2012

Scale	Count (n=44)	Percentage
5 = Completely	3	6.8%
4 = Mostly	13	29.5%
3 = Somewhat	14	31.8%
2 = Very little	5	11.4%
1 = Not at all	3	6.8%
Don't know	2	4.5%
No response	4	9%
Total	44	100%

Participants were asked to explain the reasons behind the rating they selected. The participants who found that the exercise program completely met their needs reported that someone was always there when needed and they felt motivated throughout the program. Of those who were mostly satisfied, the reasons included improvements in function, mobility, and strength. Those who were only somewhat satisfied reported ongoing pain, exercise difficulty, and discontinuation of the program due to lack of progress. Finally, those who rated their level of satisfaction as very little or not at all reported that there was a lack of follow up, lack of change and exercise difficulty as reasons for their ratings.

Results—Process Evaluation

Participants were then asked to identify the things that were most helpful about the Home Support Exercise Program. Many participants indicated that the program helped reduce their pain which in turn made them feel better (48%). Many felt that the support they received was the most helpful thing about the program (30%), while others indicated the program’s format made it easy to follow (23%).

When the participants were asked to indicate the things they found to be the least helpful about the HSEP program, a few (13%) took the opportunity to mention the lack of support and follow-up throughout the entire program. Many (33%) felt that some of the exercises were not helpful because they weren’t able to do them, either because they were too painful or too tiring. More than half of the participants (55%) did not respond, were unsure, or indicated there was nothing to mention.

Participant Recommendations

Finally, clients were asked if they had any recommendations to make on how to improve the HSEP. Some participants (23%) took the opportunity to express the need for more support and follow-up visits from a professional to help encourage clients to continue doing the exercises and monitor through follow-up visits to help motivate and ensure that the exercises are done properly. More than two-thirds of the participants (67%) did not have any recommendations for program improvements, and a few participants (9%) reported other recommendations (e.g. more exercises for the arms, continuation of the program, etc.).

The participants expressed how much they enjoyed the different exercises and the improvement of their mobility is what helps them continue to do the exercises. It was also suggested that the program offer a larger variety of types of exercises.

When the participants were asked if they were still following the program, almost half of the participants (48%) were continuing to do the exercises and of those, most (63%) were doing the exercises on a daily basis.

Summary of Process Evaluation Results

Based on the interviews, we can determine that the HSEP program was delivered in one of two different manners depending on the provider agency. While in most cases it was delivered as intended, one-on-one in the home, some agencies chose to deliver the program in a group setting.

There are number of challenges to delivering this program, including identifying suitable clients and training staff to deliver the program. From a client perspective, physical limitations, pain while doing the exercises, and lack of interest by clients are important barriers to participation in the program.

Staff who deliver the program are essential to making the HSEP work. Ongoing encouragement and support from the personal support worker or team leader is an important facilitator to continued participation in the program; this was noted by both provider agencies and client participants. In instances where clients felt there was insufficient support or follow-up, completion rates of the program were much lower. The motivation of improved mobility, balance, and function is also a very important facilitator, and should be used to “sell” the program to potential participants.

The program is very well received by agencies and most wish to continue with program delivery. The program is also well received by clients, who, for the most part, feel the program meets their needs, at least somewhat. It is also encouraging to note that almost half of the participants were continuing to do the exercises even after the completion of the program.

Results—Outcome Evaluation

Baseline Data

Baseline data was collected in two waves from 154 and 93 participants, respectively, for a total sample of 247 individuals. Participants from the two waves did not differ significantly with respect to their age, sex, risk score (as measured by the Canadian Centre for Activity and Aging’s Fall Risk Assessment tool) or TUG test scores at baseline (results not shown). The two waves did differ in the following respects:

- There were differences in the agencies participating in each wave. Nine agencies participated in the first wave, and five in the second, with only three agencies participating in both.
- Participants from the second wave were less confident in their ability to perform several daily tasks without falling at baseline, as measured by the Falls Efficacy Scale (FES). These tasks included: taking a bath or shower, reaching into cabinets and closets, getting in and out of a chair, getting dressed/undressed and performing light housework (Table 8). No significant differences in confidence between the waves were observed for the other tasks of the FES.

Table 8. Summary Statistics, Falls Efficacy Scale (FES) Scores at Baseline, by Wave

Activity	Wave 1				Wave 2				p-value for difference†
	n	Mean	SD	Range	n	Mean	SD	Range	
Take a bath/shower	154	52.0	37.3	0–100	93	40.2	35.3	0–100	p=0.011***
Reach into cabinets/closets	152	66.7	31.5	0–100	93	54.8	30.4	0–100	p=0.002***
Prepare meals	142	67.4	35.3	0–100	88	60.9	36.9	0–100	p=0.181
Walk around the house	153	74.2	28.1	0–100	93	73.5	26.7	0–100	p=0.664
Get into/out of bed	154	80.2	24.7	0–100	93	74.3	27.2	0–100	p=0.073
Answer the door/phone	154	79.1	28	0–100	93	77.7	27.5	0–100	p=0.420
Get in/out of a chair	154	80.8	22.1	0–100	93	73.1	27.0	0–100	p=0.047***
Get dressed/undressed	154	80.5	25.3	0–100	93	73.4	25.9	0–100	p=0.011***
Perform light housework	148	62.6	33.9	0–100	90	47.8	35.1	0–100	p=0.001***
Do simple shopping	147	52.2	38.9	0–100	89	54.1	36.6	0–100	p=0.758

† Mann-Whitney Sum Rank Test ; ***Denotes statistically-significant differences

- Participants from the second data collection wave were more likely to complete *both* the baseline and post-intervention FES and TUG Tests (77.4%) compared to participants in the first wave (57.1%).

With these differences noted, data from both waves were combined and analysed as one sample of participants, the baseline characteristics of which are presented in Table 9.

Table 9. Participant Profile, Baseline, Completes vs. Incompletes (n=247)

	Total	Completes	Incompletes	p-value for difference
Number of Participants	247	160	87	
Participating Agency				p=0.014†***
Sudbury East Seniors Support	7 (2.8%)	5 (3.1%)	2 (2.3%)	
Alzheimer's Society	35 (14.2%)	21 (13.1%)	14 (16.1%)	
Bayshore Home Health	99 (40.1%)	68 (42.5%)	31 (35.6%)	
Centre de santé communautaire	13 (5.3%)	11 (6.9%)	2 (2.3%)	
Comcare Health Services	19 (7.7%)	15 (9.4%)	4 (4.6%)	
Dr. Cox's office	5 (2%)	1 (0.6%)	4 (4.6%)	
Canadian Red Cross	40 (16.2%)	17 (10.6%)	23 (26.4%)	
Retire At Home Services	2 (0.8%)	1 (0.6%)	1 (1.1%)	
Revera	17 (6.9%)	13 (8.1%)	4 (4.6%)	
Ukrainian Seniors Centre	10 (4%)	8 (5%)	2 (2.3%)	
Age (Years)				p=0.150 ‡
n	243	158	84	
Mean	80	80.7	78.8	
Standard Deviation	9.0	8.3	10.0	
Range	41–96	53–96	41–96	
Age Categories				p=0.783Ω
<70 years	27 (11.2%)	17 (10.8%)	10 (11.9%)	
70-74 years	25 (10.3%)	16 (10.1%)	9 (10.7%)	
75-79 years	41 (16.9%)	23 (14.6%)	18 (21.4%)	
80-84 years	66 (27.3%)	44 (27.8%)	22 (26.2%)	
85-89 years	54 (22.3%)	38 (24.1%)	16 (19%)	
> 90 years	29 (12%)	20 (12.7%)	9 (10.7%)	
Sex				p=0.675†
Male	67 (27.1%)	42 (26.3%)	25 (28.7%)	
Female	180 (72.9%)	118 (73.8%)	62 (71.3%)	
Risk*				p=0.306‡
n	243	158	85	
Mean	5.4	5.3	5.6	
Standard Deviation	1.9	1.9	1.9	
Range	0–10	0–10	2–10	
Risk Group*				p=0.724†
Not at risk for falling	37 (15.2%)	25 (15.8%)	12 (14.1%)	
At risk for falling	206 (84.8%)	133 (84.2%)	73 (85.9%)	

† Fischer's Exact Test; ‡ Mann-Whitney Sum Rank Test; Ω Chi-Square Test with missing excluded

***Denotes statistically-significant difference

* Risk scores are based on the Canadian Centre for Activity and Aging's Fall Risk Assessment

† Chi-Square Test with missing excluded; ‡ Mann-Whitney Sum Rank Test;

Percentages shown are column percentages

Clients came from 10 different participating agencies. The agencies with the most clients participating were Bayshore (n=99), the Red Cross (n=40), and the Alzheimer’s Society (n=35). Clients’ ages ranged from 41 to 96 years, with a mean age of 80 years. More than two-thirds (72.9%) of the clients were female. A large majority (84.8%) were classified as being at risk for falling, based on them having at least four of the core elements of the Canadian Centre for Activity and Aging’s Fall Risk Assessment.

Post-intervention data were obtained from 160 (64.8%) of the 247 clients captured at baseline. Two clients providing post-intervention data were excluded because baseline measurements were not available.

Clients with both pre- and post-intervention data (“Completes”) did not differ significantly from those with baseline data only (“Incompletes”), except with respect to the participating agency from which they came.

As shown in Tables 3 and 4, clients reported a very wide range of confidence in their ability to perform various everyday tasks without falling, from complete confidence (i.e. a score of 100) to no confidence whatsoever (i.e. a score of 0). Clients were most confident in their abilities to get in/out of bed, answer the door or telephone, get in/out of a chair, and to get dressed/undressed and were least confident in their abilities to do simple shopping, take a bath or shower, and to perform light housework.

Overall, clients with complete data appear to have been slightly more confident in their ability to perform tasks without falling than were clients with baseline data only (Tables 10 and 11) but these differences were not statistically significant.

Table 10. Summary Statistics, Falls Efficacy Scale (FES) Scores, Baseline, Completes vs. Incompletes

Activity	Completes				Incompletes				p-value for difference†
	n	Mean	SD	Range	n	Mean	SD	Range	
Take a bath/shower	160	47.2	37.5	0–100	87	48.3	36.1	0–100	p=0.854
Reach into cabinets/closets	160	62.2	30.7	0–100	85	62	33.3	0–100	p=0.988
Prepare meals	153	68.1	34.9	0–100	77	58.6	37.4	0–100	p=0.070
Walk around the house	160	76.7	25	0–100	86	68.7	31.1	0–100	p=0.091
Get into/out of bed	160	79.3	25.3	0–100	87	75.5	26.6	0–100	p=0.152
Answer the door/phone	160	79.8	27.1	0–100	87	76.3	28.8	0–100	p=0.400
Get in/out of a chair	160	79.3	24.2	0–100	87	75.2	24.4	0–100	p=0.148
Get dressed/undressed	160	79.5	24.9	0–100	87	74.7	26.9	0–100	p=0.190
Perform light housework	156	57.9	34.5	0–100	82	55.4	36.4	0–100	p=0.694
Do simple shopping	155	55.8	37.8	0–100	81	47.5	38	0–100	p=0.090

† Mann-Whitney Sum Rank Test ; ***Denotes statistically-significant differences

Table 11. Frequency, Falls Efficacy Scale (FES) Scores, Baseline, Completes vs. Incompletes

Activity	Group	n	Frequency of Falls Efficacy Scale (FES) Score				
			0-19	20-39	40-59	60-79	80-100
Take a bath/shower	Comp	160	48 (30.0%)	20 (12.5%)	30 (18.8%)	14 (8.8%)	48 (30.0%)
	Incomp	87	24 (27.6%)	10 (11.5%)	15 (17.2%)	11 (12.6%)	27 (31.0%)
Reach into cabinets/closets	Comp	160	16 (10.0%)	18 (11.3%)	37 (23.1%)	26 (16.3%)	63 (39.4%)
	Incomp	85	9 (10.6%)	12 (14.1%)	20 (23.5%)	7 (8.2%)	37 (43.5%)
Prepare meals	Comp	153	19 (12.4%)	17 (11.1%)	13 (8.5%)	17 (11.1%)	87 (56.9%)
	Incomp	77	14 (18.1%)	9 (11.7%)	11 (14.3%)	10 (13.0%)	33 (42.9%)
Walk around the house	Comp	160	7 (4.4%)	2 (1.3%)	22 (13.8%)	33 (20.6%)	96 (60.0%)
	Incomp	86	8 (9.3%)	5 (5.8%)	13 (15.1%)	15 (17.4%)	45 (52.3%)
Get into/out of bed	Comp	160	6 (3.8%)	8 (5.0%)	16 (10.0%)	24 (15.0%)	106 (66.3%)
	Incomp	87	4 (4.6%)	4 (4.6%)	12 (13.8%)	9 (10.3%)	58 (67.7%)
Answer the door/phone	Comp	160	9 (5.7%)	8 (5.0%)	8 (5.0%)	24 (15.0%)	111 (69.4%)
	Incomp	87	5 (5.8%)	3 (3.5%)	14 (16.1%)	8 (9.2%)	57 (65.5%)
Get in/out of a chair	Comp	160	4 (2.5%)	7 (4.4%)	16 (10.0%)	31 (19.4%)	102 (63.8%)
	Incomp	87	1 (1.2%)	4 (4.6%)	19 (21.8%)	10 (11.5%)	53 (60.9%)
Get dressed/undressed	Comp	160	7 (4.4%)	7 (4.4%)	11 (6.9%)	21 (13.1%)	114 (71.2%)
	Incomp	87	4 (4.6%)	5 (5.8%)	11 (12.6%)	13 (14.9%)	54 (62.1%)
Perform light housework	Comp	156	33 (21.2%)	11 (7.1%)	26 (16.7%)	28 (18.0%)	58 (37.2%)
	Incomp	82	20 (24.4%)	10 (12.2%)	13 (15.9%)	9 (11.0%)	30 (36.6%)
Do simple shopping	Comp	155	40 (25.8%)	11 (7.1%)	21 (13.6%)	24 (15.5%)	59 (38.1%)
	Incomp	81	28 (34.6%)	3 (3.7%)	17 (21.0%)	10 (12.4%)	23 (28.4%)

Percentages shown are row percentages

TUG Test results were available for 148 clients with both pre- and post-intervention data (92.5%) and 77 clients (88.5%) with baseline data only (Table 12). Clients with complete data were able to complete the test in 20.7 seconds on average, though this varied significantly between clients (range 5-75, standard deviation=13.7 seconds). Most clients (60.2%) were able to complete the test in less than 20 seconds, indicating some degree of independence. Note that a final score of 10 seconds or under suggests that the participant is independent, a score between 11 and 19 second suggests that the participant is semi-independent, and a final score of 20 seconds or more suggests that the participant is dependent (Johnson, 2003).

Clients with incomplete data took slightly longer on average to complete the TUG test on average (mean=25.8 seconds), but the difference is not statistically significant. These clients also had a wider range in complete times (i.e. from 5–98.5 seconds; standard deviation 19.0 seconds). A smaller proportion (48.1%) of these clients was able to complete the test in less than 20 seconds.

Table 12. Summary Statistics and Frequencies, TUG Test Results, Baseline, Completes vs. Incompletes

Group	n	Mean	SD	Range	Level of Dependence *		
					Independent	Semi-Dependent	Dependent
Completes	148	20.7	13.7	5–75	22 (14.9%)	67 (45.3%)	59 (39.9%)
Incompletes	77	25.8	19	5–98.5	9 (11.7%)	28 (36.4%)	40 (52.0%)
p-value for difference				p=0.072†			

Four outliers have been excluded

* Independent=0-9 seconds; Semi-Dependent=10-19 seconds; Dependent=20+ seconds;

Percentages shown are row percentages

† Mann-Whitney Test; ***Denotes statistically-significant differences

Post-Intervention Results

Overall, data were available from 160 clients having both pre- and post-intervention scores for the Falls Efficacy Scale. There was wide variation in the degree and direction of change in clients' confidence in their abilities to perform everyday tasks without falling. Both large increases and large decreases in confidence were reported post-intervention (Tables 13 and 14).

Overall, results appear to indicate a small increase in confidence within the client population following the intervention. The mean difference between pre- and post-intervention FES scores was positive for all of the 10 elements of the scale (Table 13). Significant positive differences were observed in clients' confidence in their ability to take a bath/shower, walk around the house, get in or out of bed, and to answer the door/phone. Between 20% and 30% of clients reported being more confident in each the tasks comprising the FES test, compared to the 12–21% who reported being less confident (Table 13). Note that a majority (i.e. 50–63%) of clients reported no change in their level of confidence.

Table 13. Summary Statistics, Change in Falls Efficacy Scale (FES) Scores, Pre- to Post-Intervention (n=160)

Activity	n	Mean	SD	Range	p-value for difference†
Take a bath/shower	156	6.5	26.4	-70–100	p=0.005***
Reach into cabinets/closets	157	1.2	21.8	-60–70	p=0.270
Prepare meals	149	2.7	20.8	-80–90	p=0.149
Walk around the house	156	3.7	19	-70–80	p=0.002***
Get into/out of bed	157	3.3	16.8	-40–80	p=0.003***
Answer the door/phone	157	2.4	17.6	-40–90	p=0.018***
Get in/out of a chair	157	1.1	20.3	-100–70	p=0.114
Get dressed/undressed	157	0.6	17.8	-60–70	p=0.064
Perform light housework	153	2.4	22.9	-70–100	p=0.279
Do simple shopping	150	0.3	22.1	-100–80	p=0.496

Four outliers have been excluded

† Wilcoxon Sign-Rank Test

***Denotes statistically-significant differences

Table 14. Frequency, Level of Change in Falls Efficacy Scale (FES) Scores, Pre- to Post-Intervention (n=160)

Activity	n	Negative Change *			No Change	Positive Change *		
		Large	Moderate	Small		Small	Moderate	Large
Take a bath/shower	156	11 (7.1%)	9 (5.8%)	1 (0.6%)	90 (57.7%)	4 (2.6%)	16 (10.3%)	25 (16%)
Reach into cabinets/closets	157	23 (14.6%)	7 (4.5%)	3 (1.9%)	79 (50.3%)	6 (3.8%)	16 (10.2%)	23 (14.6%)
Prepare meals	149	13 (8.7%)	10 (6.7%)	2 (1.3%)	88 (59.1%)	3 (2%)	10 (6.7%)	23 (15.4%)
Walk around the house	156	12 (7.7%)	9 (5.8%)	0 (0.0%)	89 (57.1%)	7 (4.5%)	10 (6.4%)	29 (18.6%)
Get into/out of bed	157	11 (7%)	7 (4.5%)	1 (0.6%)	97 (61.8%)	3 (1.9%)	23 (14.6%)	15 (9.6%)
Answer the door/phone	157	15 (9.6%)	4 (2.5%)	1 (0.6%)	99 (63.1%)	5 (3.2%)	13 (8.3%)	20 (12.7%)
Get in/out of a chair	157	20 (12.7%)	9 (5.7%)	1 (0.6%)	82 (52.2%)	5 (3.2%)	19 (12.1%)	21 (13.4%)
Get dressed/undressed	157	17 (10.8%)	8 (5.1%)	0 (0.0%)	90 (57.3%)	7 (4.5%)	22 (14%)	13 (8.3%)
Perform light housework	153	15 (9.8%)	11 (7.2%)	3 (2.0%)	88 (57.5%)	2 (1.3%)	12 (7.8%)	22 (14.4%)
Do simple shopping	150	15 (10%)	10 (6.7%)	1 (0.7%)	90 (60%)	5 (3.3%)	14 (9.3%)	15 (10%)

Four outliers have been excluded

** A positive change indicates an increase in respondent’s confidence in doing the specified task.*

Small Change=1–9 point difference; Moderate Change=10–19 point difference;

Large Change>=20 point difference.

Percentages shown are row percentages

As with confidence, the observed changes in the TUG test results varied widely between clients, but the overall results appear to support a positive outcome overall (Table 15 and Figure 1). The time required for clients to complete the TUG test decreased by 2.1 seconds on average, a difference that is statistically significant. A majority (58.4%) of clients took less time to complete the test post-intervention, compared to 22.8% who took a greater amount of time.

Table 15. Summary Statistics and Frequencies, Change in TUG Test Results, Pre- to Post-Intervention (n=142)

Measure	Result	
n	141	
Mean	-2.1	
SD	9.2	
Range	-56–33	
p-value for difference†	p<0.001***	
Frequency, Level of Change		
Positive Change*	Large	6 (4.3%)
	Moderate	3 (2.1%)
	Small	74 (51.8%)
No Change		26 (18.4%)
Negative Change *	Small	29 (20.6%)
	Moderate	1 (0.7%)
	Large	3 (2.1%)

Five outliers have been excluded

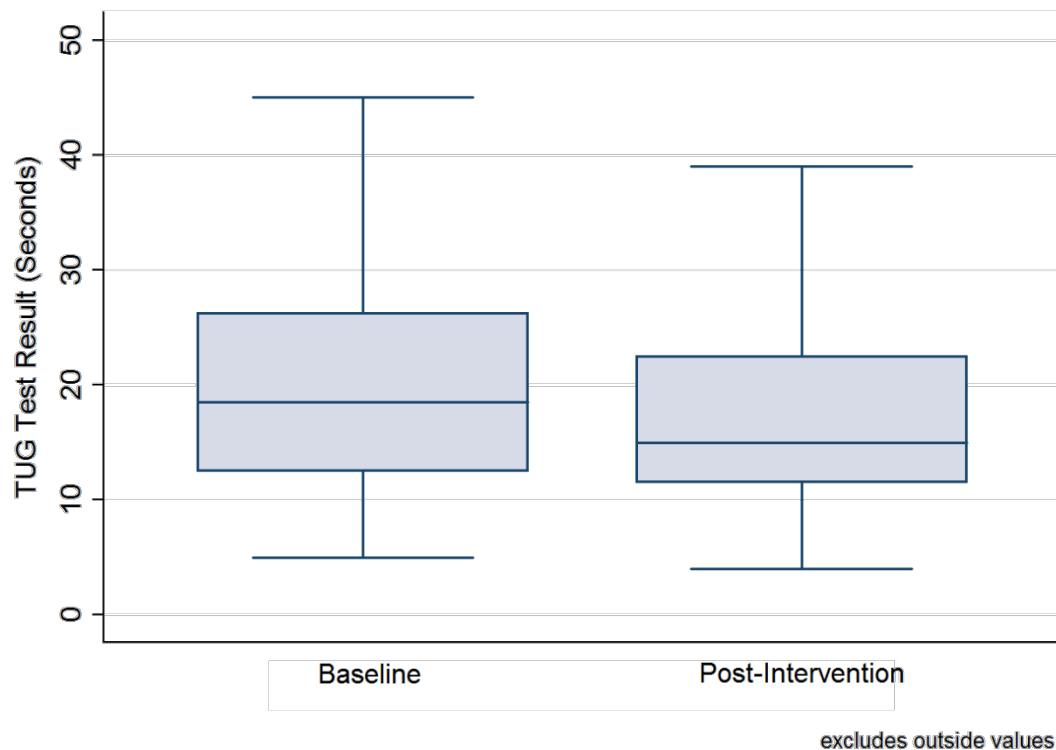
*† Wilcoxon Sign-Rank Test ; ***Denotes statistically-significant difference*

** Positive change indicates a decrease in the time taken to complete the test.*

Small Change=1–9 second difference

Moderate Change=10–19 second difference

Large Change>=20 second difference

Figure 1. Boxplots, TUG Test Results, Baseline vs. Post-Intervention

The level of improvement in TUG test results was not significantly associated with either age or gender, nor with data collection wave (Table 16).

Results did vary by the client’s level of risk of falling at baseline, with a Spearman’s rho of -0.255 indicating a small but significant improvement in TUG test results with increasing levels of risk. Those clients who were categorized as being at risk for falling saw a mean decrease in their TUG test results of 2.3 seconds post-intervention, compared to a mean decrease of 1.1 seconds among those not at risk. Note that this difference is not statistically significant.

Clients who took longer to complete the baseline TUG test showed greater improvement on average than clients with higher baseline TUG test scores, with a Spearman’s rho of -0.403 indicating a moderate but significant negative correlation. The improvement among clients who completed their baseline TUG Test in 20 seconds or more (i.e. “dependent” clients) was 6 seconds on average, significantly better than clients who completed their baseline test in a faster time (Figure 2).

Results varied by participating agency. Clients from Bayshore Home Health, Centre de santé communautaire, Canadian Red Cross, and the Ukrainian Seniors Centre saw a significantly larger improvement than other agencies, with a mean decrease between 3.1 and 3.6 seconds.

Table 16. Subgroup Analysis, Change in TUG Test Results, Pre- to Post-Intervention

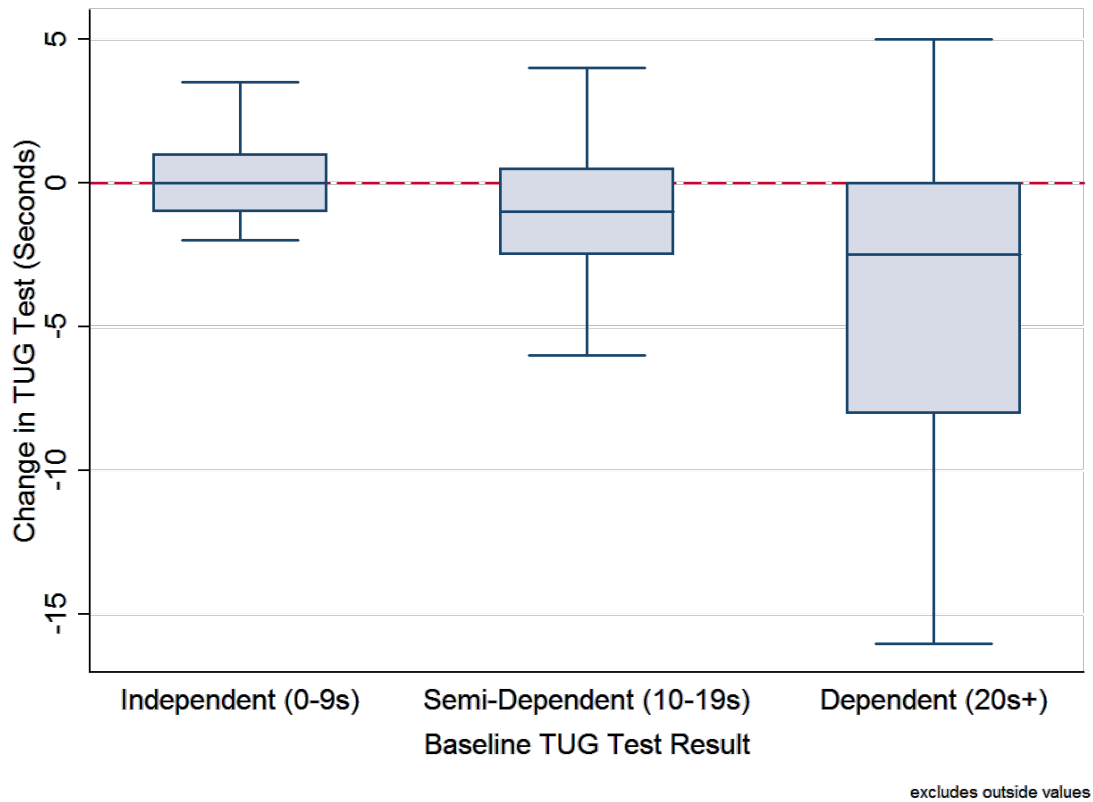
Group	n	Mean	SD	Range	Correlation	p-value for difference
Data Collection Wave						p=0.848 γ
Wave 1	80	-2.3	9.0	-56–33		
Wave 2	31	-3.0	7.5	-36.5–30		
Participating Agency						p=0.006 \dagger ***
Sudbury East Seniors Support	5	1.0	1.9	-1.5–3.5		
Alzheimer’s Society	21	-0.1	1.6	-3–4		
Bayshore Home Health	59	-3.4	12.4	-56–30		
Centre de santé communautaire	11	-3.5	5.1	-16–1		
Comcare Health Services	13	0.2	12.2	-23–33		
Canadian Red Cross	13	-3.4	3.4	-8.5–0.5		
Revera	11	0.4	2.3	-2–6		
Ukrainian Seniors Centre	8	-3.1	1.9	-6–1		
Age (Years)	140	-	-	-	rho=0.141	p=0.099 \ddagger
Age Categories						
<70 years	13	-1.0	3.9	-8.5–5		p=0.257 \dagger
70-74 years	15	-3.2	13.6	-36.5–33		
75-79 years	21	-5.1	7.4	-22.5–0.5		
80-84 years	39	-2.3	9.7	-56–14		
85-89 years	34	0.3	9.1	-23–30		
> 90 years	17	-2.5	8.6	-34–4		
Sex						
Male	37	-1.6	4	-15.5–7		p=0.991 γ
Female	104	-2.3	10.4	-56–33		
Risk	141	-	-	-	rho= -0.252	p=0.003 \ddagger ***
Risk Category						p=0.294 γ
Not at risk for falling	23	-1.1	2.7	-8.5–4		
At risk for falling	117	-2.3	10.0	-56–33		
Missing	1					
Baseline TUG Test Scores	142	-	-	-	rho=-0.422	p<0.001 \ddagger ***
Independent (0-9sec)	19	1.6	7.7	-2–33		p=0.009 \dagger ***
Semi-Dependent (10-19sec)	67	0.1	6.3	-9–30		
Dependent (20+ sec)	55	-6.0	11.1	-56–5		

Four outliers have been excluded

** Risk scores are based on the Canadian Centre for Activity and Aging’s Fall Risk Assessment*

\dagger Kruskal-Wallis Test; \ddagger Spearman Rank Correlation; γ Mann-Whitney Test;

****Denotes statistically-significant difference*

Figure 2. Boxplots, Change in TUG Test Results, by Baseline TUG Test Result

Regression Modeling of TUG Test Results

A multiple linear regression model was fit to the data in order to examine the concurrent effects of age, sex baseline TUG test result, baseline risk, agency, and data collection wave upon the change in TUG Test result from baseline following intervention. That is, what effect did each factor have on the outcome when the effects of each of the other factors are taken into account?

Results (Table 17) indicate the final regression model is a significant predictor of the outcome, and that the variables included in the model explain a good proportion (64%) of the variance in that outcome.

Table 17. Results, Multiple Linear Regression, Change in TUG Test

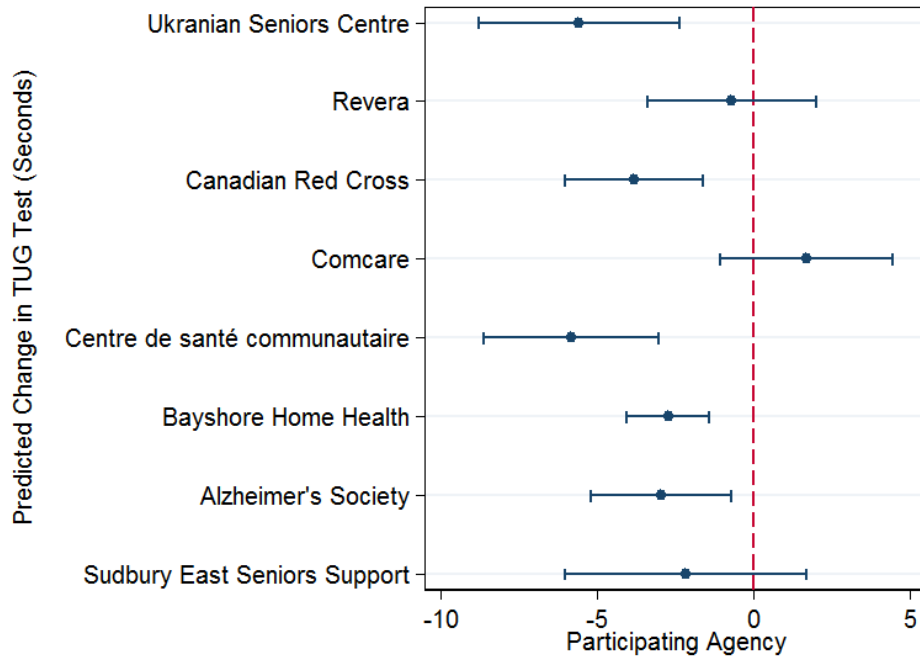
Factor	B	SE	t	p> t	95% CI (B)	
Age	0.01	0.04	0.21	0.837	-0.08	0.10
Sex (Female)	-1.35	0.86	-1.56	0.122	-3.05	0.36
Risk	-0.18	0.22	-0.82	0.414	-0.62	0.26
Participating Agency						
Comcare (Reference)						
Sudbury East Seniors Support	-3.84	2.47	-1.56	0.123	-8.73	1.05
Alzheimer's Society	-4.61	1.89	-2.44	0.016***	-8.36	-0.87
Bayshore Home Health	-4.41	1.59	-2.77	0.006***	-7.55	-1.26
Centre de santé communautaire	-7.51	2.05	-3.66	0.000***	-11.57	-3.45
Canadian Red Cross	-5.48	1.77	-3.09	0.003***	-9.00	-1.97
Revera	-2.38	2.03	-1.17	0.244	-6.40	1.64
Ukrainian Seniors Centre	-7.25	2.14	-3.39	0.001***	-11.49	-3.01
Baseline TUG Test Result	-0.13	0.11	-1.23	0.222	-0.35	0.08
Wave	2.83	1.91	1.48	0.142	-0.96	6.61
Baseline TUG Test Result X Wave	-0.19	0.07	-2.75	0.007***	-0.32	-0.05
Constant	9.71	4.40	2.21	0.029	0.99	18.42

Regression Model Fit Statistics: $n=132$; $F(13,118)=15.8$; $\text{Prob}>=0.000$; $R^2=0.635$
 ***Denotes statistically significant model parameters

As with the results previously shown, after adjusting for other factors, age and sex were not significant predictors of the change in TUG Test result. Neither was the clients' level of risk at baseline—as measured by the Canadian Centre for Activity and Aging's Fall Risk Assessment – which is a change from previous results.

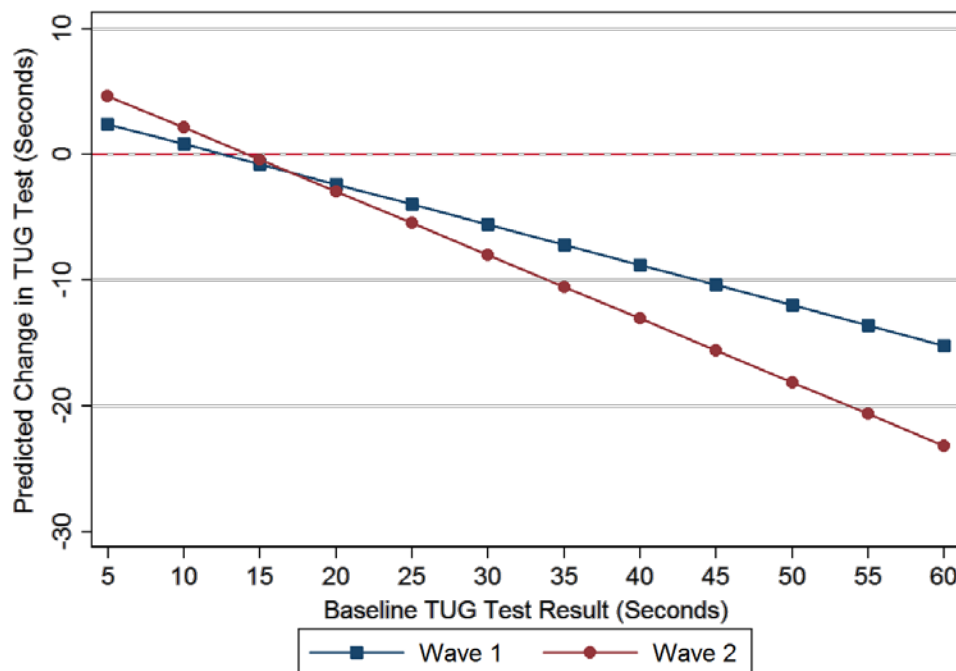
According to the regression model, being a client from one of five agencies (i.e. Alzheimer's Society, Bayshore Home Health, Centre de santé communautaire, the Canadian Red Cross, and the Ukrainian Seniors Centre) was associated with a statistically significant predicted improvement in TUG Test after adjusting for other factors. There were no significant differences in effect between those five agencies. The predicted change in TUG Test results for the other three agencies modeled was not significantly different from zero (i.e. no change) when accounting for the other factors in the model.

Figure 3. Predictive Margins, Change in TUG Test, by Participating Agency



The Linear regression analysis confirmed that clients with poorer TUG Test results at baseline saw a greater improvement on average following the intervention than did clients with better initial test results. Interestingly, this effect was significantly greater among clients in the second data collection wave than in the first (Figure 4).

Figure 4. Predictive Margins, Change in TUG Test, by Baseline TUG Test Result and Data Collection Wave



Summary of Outcome Evaluation Results

The results presented in the preceding section appear to demonstrate a small yet significant improvement among clients following implementation of the program. On average, clients who completed the program achieved a 2.1 second improvement in their TUG test results, which is statistically significant (Table 10). More than half (58.4%) of the clients who completed the program saw their TUG test results improve from baseline, most (52.1%) by between 1 and 10 seconds. As well, overall client confidence appeared to improve for all of the components of the Falls Efficacy Scale (FES), though this improvement was statistically significant for only 4 of the 10 components (Tables 6 and 7).

Improvement in mobility (i.e. TUG Test) was more pronounced among clients with poorer baseline TUG Test scores (Figures 2 and 4). This finding confirms what is known of the positive effect of participation in physical activity on the maintenance of health and functional independence in older adults, as well as its ability to lower risks for falls and fall-related injuries and to restore function to a level allowing for increased autonomy in the performance of everyday activities (Freedman et al., 2006; Rose, 2006).

The level of improvement in mobility varied by participating agency (Figure 3), and these differences persisted after adjusting for other client characteristics. The differences may be related to how the program was delivered, or to other explanatory factors not captured in the analysis. The differences do not appear to be related to delivery of the program in a group vs. an individual setting.

Clients who were risk for falling (as measured by the Canadian Centre for Activity and Aging's Fall Risk Assessment) had larger improvements in mobility on average, though this effect appears to be explained by other factors; the effect of baseline risk is not statistically significant after adjusting for those other factors using linear regression.

Linear regression analysis revealed a significant interaction between the data collection wave and baseline TUG Test score. While having a poorer baseline TUG Test result increased a client's improvement in TUG Test results on average, this effect was significantly more pronounced in the second data collection wave (Figure 4). This may be due to changes in the implementation of the program between the two waves. A greater effort was made in the second wave to obtain a high rate of completion of the post-intervention tests, which likely focused on higher risk/lower mobility clients (who had a higher rate of drop-out during the first wave).

Limitations

The lack of a comparison group (in which the intervention was not delivered) limits our ability to attribute the observed improved client outcomes to the implementation of the program. However, to the best of our knowledge, there were no changes in the clients' environment that may have otherwise led to their improved results in the absence of the intervention (although data was not collected on the environment). And, while the act of simply taking repeated measurements may have led to some improvement in those measures over time, it is unlikely that this would have a noticeable impact relative to implementation of an eight-week exercise program. It is, therefore, reasonable to conclude that the exercise program was responsible for at least some of the observed improvement.

Post-intervention measurements were available for only 160 of the original 247 clients with baseline measurements, with a higher rate of completion during the second wave. The exclusion of the non-completes from the pre-post analysis brings with it the potential to bias these results, should they differ significantly from those who completed the program in ways that might impact their level of improvement. The analysis presented in Table 2 indicates that the two groups did not differ significantly with respect to any variable measured in this study, except the agency from which they came. It is possible that bias has been introduced by differences between completes and incompletes in factors not measured here.

Conclusion and Implications for Practice

The findings of this evaluation demonstrate that participation in the Home Support Exercise Program (HSEP) is associated with a small yet statistically significant improvement in client confidence and mobility. The program appears to be especially effective among higher risk clients—those with lower mobility at baseline. The program is seen as beneficial in that it is simple and consistent, and enables participants to move and feel better. It is used as an entry point for exercise for people who are at serious risk of falling so that they can then progress to other programs. Both the development and implementation of the program have provided a tremendous learning experience for provider agencies.

These findings provide support for the broader implementation of the HSEP among older adults in Sudbury as a means to help them maintain their health, balance, and functional independence, and to lower their risk for falls and fall-related injuries.

However, there are a number of items that need to be considered with broader implementation of the HSEP.

Appropriate processes need to be in place in order to properly identify suitable clients for the program. Upon recruitment of clients, promotion of the evidence-informed benefits of the HSEP should be highlighted. This could help with increasing client interest in the program.

The results of the process evaluation underline the importance of providing clients with ongoing encouragement and support for continuation of the exercises. As enthusiasm of the personal support workers or program leader is seen as key to making the HSEP work, a greater understanding of the value of this support and the benefits of the HSEP for clients should be emphasized in the training.

Having ongoing support to encourage clients would likely help them mitigate some of the physical limitations that are an important barrier to completing the program. Clients need to be able to persevere through some of the pain earlier on, as once they notice an improvement in mobility, this becomes an important facilitator to continuing on with the program.

Ensuring consistency with the worker (be it a personal support worker or other support person) is also important since this person plays such a key role in clients continuing the program. It would be valuable for all support people to receive consistent, systematic training. In addition, it would be helpful if all workers who are supporting clients with the HSEP could have an opportunity to share lessons learned and approaches that have been successful with clients.

Conclusion and Implications for Practice

There is also a need to further explore the instances where the program is being delivered in a group format. As noted, this format is different than the intent of the HSEP, which is a program that is meant to be delivered on an individual level. Other similar programs currently exist, such as Stand Up!, which is intended for group delivery with more mobile seniors. It would be important to determine what, if any, overlap with the delivery of HSEP in a group setting and Stand Up!

Overall, the results of this evaluation are supportive on continuation of the HSEP in Sudbury and Manitoulin districts.

Of note, since the evaluation of the HSEP was undertaken, there have been a number of additional HSEP training opportunities. Several new agencies have come on board to deliver the program, including the Health Sciences North Cardiac Rehabilitation program. Chapleau Home Care staff also want to incorporate the HSEP as part of their services; they have received training and resources and will work collaboratively with the HSEP lead at the NE CCAC. There has also been a collaboration established between the SDHU and the Manitoulin Central Family Health Team, who has offered training on several occasions to interested front line staff at community partner agencies on Manitoulin Island. In addition, College Boreal is now training their Physiotherapy Assistant students and students in their physical activity programs, and Everest College hopes to pilot the HSEP with all of their Personal Support Worker students this coming year.

In addition, the North-East CCAC evaluated the impact of the HSEP program as experienced by their own clients. They concluded that the program shows significant improvement in the reduction of falls, which confirms other research on the HSEP. They have since started offering the program to all clients who are receiving personal support through the CCAC and who are cognitively able to complete the program on their own or with the help of the caregiver.

In conclusion, it would appear that the program has been well received by the community, and the agencies that work with the older adult population in the SDHU catchment area are continuing to offer this important program to their clients.

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Appendix A: Description of Outcome Evaluation Tools

The Falls Efficacy Scale (FES) is an instrument to measure fear of falling, which is based on the operational definition of this fear as "low perceived self-efficacy at avoiding falls during essential, nonhazardous daily activities". Following a series of questions related to simple household activities, subjects who reported avoiding these activities because of fear of falling had higher FES scores, representing lower self-efficacy or confidence, than subjects who did not report fear of falling (Tinetti, Richman and Powell, 1990). Expected associations with age, sex, physical activity, chronic diseases, and history of falls were confirmed by Bosscher (2005). Therefore, the FES appears to be a reliable and valid instrument to measure fear of falling in performing everyday activities and may be useful in assessing the independent contribution of fear of falling to functional decline among elderly people (Tinetti, Richman and Powell, 1990).

The TUG test is simple, safe, and sensitive method to measure change with activity. It can provide a "snapshot" of an older adult's function. This test requires the participant to sit in a standard armchair (seat height approximately 46 cm and arm height approximately 65 cm) with his or her back against the chair and arms resting on the chair's arms. On the word "go," the participant will get up and walk at a comfortable and safe pace to a line on the floor 3 meters away and will then turn, return to the chair, and sit down again. A final score of 10 seconds or under suggests that the participant is independent, a score between 11 and 19 second suggests that the participant is semi-independent, and a final score over 20 seconds suggests that the participant is dependent (Alberta Centre for Active Living, 2006; Johnson, 2003).

Appendix B: Home Support Exercise Program—Interview Questions for Key Informants

Home Support Exercise Program
Interview questions for Key Informants
March 2012

- Name
 - Agency
 - Role
 - Your involvement with HSEP (length of time; nature of involvement; familiarity with the program)
-
1. When did your agency start bringing clients into the HSEP?
 2. What are the criteria you use for recruiting clients for HSEP? What kind of clients are excluded (if any)? Have those criteria changed at all since you started?
 3. What is the process by which clients are approached about participating?
 4. How is the program delivered by your agency (e.g., individual training at home; group setting...)? Has the method of delivery changed over time?
 5. Who delivers the program?
 6. How do you monitor the delivery of the program?
 7. What do you know about clients' reasons for not completing (e.g., choose to stop participating, and if so, why; continue participating but monitoring is not completed or not returned)? Do you have any thoughts on how a higher completion rate could be achieved?
 8. How successful has your agency been in recruiting clients to participate? What do you think are the reasons for that?
 9. What challenges have you experienced in recruiting for HSEP?
 10. How successful has your agency been in implementing the program? What do you think are the reasons for that?
 11. What challenges have you experienced in implementing the HSEP?
 12. Overall, what would you consider the strong points of the program? Do you consider HSEP to be a valuable addition to your programs?

Appendix B

13. Do you anticipate that you will continue to implement HSEP? Why? Are you planning any changes in how you implement the program?
14. What is going on at your agency with respect to HSEP that you think is unique or might make the program more or less successful?
15. What advice would you have on the HSEP program that might improve the process of recruiting and implementing for your agency?
16. Is there anything else you would like to discuss that we have not covered?

Appendix C: Evaluation of the Home Support Exercise Program (HSEP)—Telephone Survey with Client Participants

Hello, my name is _____ and I am calling on behalf of the Sudbury & District Health Unit. May I please speak to _____?

Hello _____, (respondent name, whether it's the client or caregiver)

We are doing an evaluation of the Home Support Exercise Program delivered through the home support agencies. This is the study that you had previously agreed to participate in. As part of the survey, I will be asking you questions about your level of participation in the exercise program. I will also ask you some questions about whether there are things that helped you follow the exercise program, and whether there are things that made it more difficult for you to follow the exercise program. Are you still interested in participating in this evaluation?

This survey will take a minimum of 10 to 15 minutes of your time. Your participation is confidential and voluntary. The services you are receiving from [Agency Name] will not be affected if you choose not to participate. However, your participation is **IMPORTANT** for us to be able to evaluate the Home Support Exercise Program.

Is now a good time for you?

If yes, proceed.

If no. When would be a good time for us to call you back?

Appendix C

Before we start, I'd like to let you know that I am not a Public Health Nurse. However, everything you tell me is confidential. There are no right or wrong answers, and you may refuse to answer any question, or end the survey at any time. If you have any questions or concerns about your health or about any falls, you can call the Stay On Your Feet Sudbury Manitoulin Falls Prevention Coalition at (705) 674-4330 or toll free 855-674-4330. I would also like to point out that this call may be monitored for quality assurance purposes.

1. What is your gender?
 - Female
 - Male

2. What is your age? _____ (years)

3. **How many people live in your household, INCLUDING you?** (Interviewer Prompt: By household I mean people who live together and share living expenses. Please include yourself in this count.)
 - Record response _____

4. ***(If response to #3 is more than one)*** With whom do you live?
(SELECT ALL THAT APPLY)
 - Spouse/partner
 - Child or children
 - Other family members
 - Non-family

5. Have you had a fall or a near fall since you started the Home Support Exercise Program?
 - Yes I had a fall – Frequency: _____
 - Yes, I had a near fall – Frequency: _____
 - No
 - Don't know/don't remember

6. When you did the Home Support Exercise Program, did you do by yourself at home, or in a group setting?
 - By myself at home
 - Group setting
 - Both

7. Did you complete the Home Support Exercise Program? This includes doing the exercises for a period of 8 weeks.
- Yes
 - No
 - Don't know/don't remember

(If response to #7 = No or Don't Know, ask # 8-11)

8. For how many weeks did you follow the Home Support Exercise Program?

- Record Response _____ weeks
- Don't remember

9. Approximately how many days per week did you do the exercises in the Home Support Exercise Program?

- Record Response _____ days
- Don't remember

10. On average, approximately how many minutes per day did it take you to do the exercises in the Home Support Exercise Program?

- Record Response _____ minutes
- Don't remember

11. You indicated that you did not complete the Home Support Exercise Program. Can you tell me the reasons why you did not complete it?

(If response to #7 = Yes, ask #12-13)

12. Approximately how many days per week did you do the exercises in the Home Support Exercise Program?

- Record Response _____ days
- Don't remember

13. On average, approximately how many minutes per day did it take you to do the exercises in the Home Support Exercise Program?

- Record Response _____ minutes
- Don't remember

(For all)

Appendix C

14. What kinds of things or people helped you do the Home Support Exercise Program? (*Interviewer prompts: motivation to improve mobility, family member, personal support worker, etc.*)

15. What were the things that made it difficult for you do the Home Support Exercise Program? What challenges did you encounter? (*Interviewer prompts: not feeling well, too difficult to find the time, exercises were too painful or too tiring, etc.*)

16. To what extent has the Home Support Exercise Program met your needs and expectations?

5 4 3 2 1
Completely Mostly Somewhat Very little Not at all

What are your reasons for that rating?

17. What did you find most helpful about the Home Support Exercise Program?

18. What did you find least helpful about the Home Support Exercise Program?

19. Do you have any recommendations on how to improve the Home Support Exercise Program?

20. Are you still continuing to do the program?

- Yes
- No

(If response to #20 = Yes, ask #21)

21. Approximately how many times per week are you doing the exercises?
- Record Response _____ days
 - Don't remember

Thank you!



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