‘IF SHE CAN DO IT, I CAN DO IT’: AN EXPLORATORY ANALYSIS OF PEER MENTORING AS AN INTERVENTION STRATEGY TO INCREASE EXERCISE PROGRAM ADHERENCE IN SEDENTARY ADULTS WITH CHRONIC HEALTH CONDITIONS

by

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Abstract

The main purpose of this study was to explore the influence of social support and self-efficacy on the physical activity beliefs and behaviours of participants in a peer-mentoring intervention embedded in a community-based exercise program. A second purpose was to explore social support, self-efficacy, and perceived barriers and facilitators to exercise program adherence for study participants within the community-based exercise program setting. Participants (N=10, plus 6 mentors) were adults with chronic health conditions living in a low-income neighbourhood. Intervention (n=4) and comparison (n=6) groups completed self-report measures of physical activity, social support, and barrier self-efficacy at baseline, 6-weeks, and 12-weeks. Interviews were used post-intervention to explore the impact of peer mentoring, perceived social support and self-efficacy within the exercise setting, and barriers and facilitators to physical activity for study participants. Intervention participants showed greater exercise program adherence than comparison participants at 6-weeks. Qualitative findings suggest the peer mentoring intervention increased motivation and sense of obligation to adhere to the exercise program, and provided vicarious learning opportunities that may have indirectly influenced exercise program adherence for intervention and mentor participants. Findings also suggest that the exercise program was highly influential to participants’ social support and self-efficacy beliefs. Multiple barriers and facilitators to physical activity were reported. Overall, the current study supports the use of peer mentoring as an intervention strategy in combination with additional strategies to promote exercise program adherence in the study population. Practical implications are discussed in relation to the promotion of exercise program adherence in older adults with chronic health conditions participating in a community-based exercise program in a low-income neighbourhood.
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# Table of Contents

Abstract ............................................................................................................................................ ii
Acknowledgements ......................................................................................................................... iii
List of Figures ............................................................................................................................. vi
List of Tables ............................................................................................................................. vii
Chapter 1 Introduction ..................................................................................................................... 1
Chapter 2 Literature Review ............................................................................................................ 4
  Physical Activity Benefits ........................................................................................................ 4
  Physical Activity Trends .......................................................................................................... 5
  Barriers to Physical Activity .................................................................................................... 6
  Self-Efficacy ............................................................................................................................ 7
  Social Support ........................................................................................................................ 13
  Summary ................................................................................................................................ 16
Chapter 3 Conceptual Framework ................................................................................................. 19
  Conceptualizations of Social Support .................................................................................... 19
  Social Support Effect Models ................................................................................................ 20
  Conceptualization of Peer Mentoring .................................................................................... 23
  Self-Efficacy Theory .............................................................................................................. 24
  Purpose ................................................................................................................................... 29
  Research Questions ................................................................................................................ 29
  Reflexivity .............................................................................................................................. 30
Chapter 4 Methods and Procedures ............................................................................................... 32
  Context and Overview ........................................................................................................... 32
  Design .................................................................................................................................... 33
  Program and Study Recruitment ............................................................................................ 34
  Study Recruitment .................................................................................................................. 35
  ‘Reach’ Physical Activity Program ......................................................................................... 35
  Peer Mentoring Intervention ................................................................................................. 36
  Retention and Sample Size .................................................................................................... 38
  Data Collection Overview ...................................................................................................... 41
  Quantitative Measures .......................................................................................................... 41
Qualitative Approach and Measures ................................................................. 45
Chapter 5 Data Analysis ...................................................................................... 49
Quantitative Analyses ......................................................................................... 49
Qualitative Analysis ............................................................................................ 49
Chapter 6 Findings ............................................................................................... 53
Quantitative .......................................................................................................... 53
Participant Characteristics .................................................................................. 53
Descriptive Statistics ......................................................................................... 53
Mann-Whitney Between Group Comparisons .................................................... 55
Wilcoxon Signed-Rank within Group Comparison .............................................. 55
Qualitative Findings ............................................................................................ 62
Peer Mentoring Intervention ............................................................................ 62
Social Support ...................................................................................................... 62
Adherence ........................................................................................................... 65
Mentoring and Self-Efficacy Beliefs ................................................................. 66
Barriers to Mentoring and Participant Suggestions ........................................ 69
‘Reach’ Exercise Program .................................................................................. 70
Outcome Expectations ....................................................................................... 70
Social Support ..................................................................................................... 71
Self- Efficacy Beliefs in the Exercise Setting .................................................... 72
Barriers and Facilitators to Physical Activity .................................................. 76
Chapter 7 Discussion ......................................................................................... 79
Summary of Findings in Relation to the Literature ........................................... 79
Limitations and Strengths .................................................................................. 90
Future Research .................................................................................................. 95
Recommendations for Practice ......................................................................... 96
Conclusion ........................................................................................................... 99
References .......................................................................................................... 101
Appendix A Recruitment Materials and Letters of Information ..................... 119
Appendix B Questionnaires ............................................................................... 129
Appendix C Interview Guide .............................................................................. 136
Appendix D Mentor Training Manual ............................................................... 138
List of Figures

Figure 1. Social support effect model .................................................................................................. 22

Figure 2. Participant retention ........................................................................................................... 40
List of Tables

Table 1. Participant characteristics .............................................................................................. 56

Table 2. Median and inter-quartile range scores for physical activity (PA), social support, barrier self-efficacy (BSE), and exercise program adherence at baseline, 6-week, and 12-week for intervention and comparison participants ........................................................................... 57

Table 3. Descriptive statistics for the Barriers Efficacy Scale for intervention and comparison participants combined at baseline (N=10) and 6-weeks (N=10) ....................................................................................... 58

Table 4. Mann-Whitney test for comparison between intervention and comparison groups on study measures at baseline (N=10) ........................................................................................................ 59

Table 5. Mann-Whitney test for comparison between intervention and comparison groups on study measures at 6-weeks (N=10) .................................................................................................... 60

Table 6. Wilcoxon Signed-Rank test for comparison of difference between baseline and 6-weeks measures in intervention group participants (N=4) ................................................................................. 61

Table 7. Wilcoxon Signed-Rank test for comparison of difference between baseline and 6-week measures in comparison group participants (N=6) ................................................................................. 61
Chapter 1

Introduction

An ongoing challenge in health-related research is to identify effective, cost-efficient, and acceptable intervention strategies to enhance physical activity behaviour in inactive populations. This emphasis is in response to disproportionately high rates of physical inactivity and associated health conditions in population subgroups (Canadian Fitness and Lifestyle Research Institute [CFLR], 2008; Warburton, Nicol, & Bredin, 2006), high attrition rates in existing physical activity programs (Dishman, Washburn, & Heath, 2004; Warburton et al., 2006; Welk, 2002), and the economic burden of inactivity on healthcare systems (Katzmarzyk & Janssen, 2004; Katzmarzyk, Gledhill, & Shephard, 2000).

The number of Canadians adults who are sufficiently active is extremely low. Fifty-two percent of Canadian adults do not meet recommended levels of physical activity to achieve health benefits (CFLRI, 2008). Rates of physical inactivity are particularly high among underserved populations, such as individuals of low socioeconomic status, older adults, and individuals with existing illness or disability (CFLRI, 2008; Clark & Nothwehr, 1999; Lox, Martin-Ginis, & Petruzello, 2006; Trost, Owen, Bauman, Sallis, & Brown, 2002). Research suggests the greatest potential for health benefits from physical activity can be achieved by increasing physical activity levels of inactive individuals (Franklin & McCullough, 2008; Myers et al., 2002; Warburton et al., 2006). Moreover, physical activity is important for the management and prevention of secondary disease in symptomatic populations (Biddle, Fox, & Boucher, 2000; Bouchard, Shephard & Stephens, 1994; Warburton et al., 2006). Given the health and economic benefits of physical activity for ‘at-risk’ populations, developing effective strategies to promote physical
activity and exercise program adherence in adults with chronic health conditions in low-income settings is an important public health concern.

Research suggests that social support is a key determinant of health and well-being (Cohen, Underwood, & Gottlieb, 2000; Hurdle, 2001; Uchino, 2004), health program adherence (Sallis & Owen, 1999), and physical activity behaviour (McAuley & Blissmer, 2000; Sallis & Owen, 1999; Trost, Owen, Sallis, & Brown, 2002). This is in part due to the influence of social support on individual judgments of personal capabilities to perform physical activity (Duncan & McAuley, 1993; O’Brien, 1995; Resnick, Orwig, Magaziner, & Wynne, 2002), which is one of the strongest and most malleable determinants of physical activity behaviour (Bandura, 1997; McAuley & Blissmer, 2000). Although research suggests that social support influences self-efficacy and physical activity in adults (Ayotte, Margrett, & Hicks-Patrick, 2010; Resnick, Orwig, Magaziner, & Wynne, 2002; Trost et al., 2002) research in this area remains underdeveloped (Biddle & Mutrie, 2008). Few studies have evaluated peer-based physical activity interventions, or explored the influences of peer support on self-efficacy within the exercise setting (McAuley, Courneya, Lettunich, 1991; McAuley, Elavsky, Jerome, Konopack, & Marquez, 2005). Additionally, research on social support and self-efficacy interventions is limited in underserved populations (Biddle & Mutrie, 2008; Clark & Nothwehr, 1999; King, 2002). Thus, little is known on how to best structure social support to facilitate self-efficacy and exercise program adherence in sedentary adults with chronic health conditions in low-income settings.

It is important to understand the factors that influence physical activity participation in specific at-risk populations (Dishman, 1994; King, 2002) and explore new approaches to promote social support and self-efficacy that can be translated into practical intervention strategies. A better understanding of the perceived factors that influence the physical activity of adults with
chronic health conditions in a low-income setting can help structure interventions to enable individuals to adhere to exercise programs and thus positively influence their health.

For the current study, a specific exercise program and population of sedentary adults with chronic health conditions in a low-income neighbourhood was purposefully sampled to study the contextual factors that influence physical activity and exercise program adherence based on a community-identified need. A peer mentoring intervention was implemented within the existing community-based exercise program to explore the impact of social support on the physical activity beliefs and behaviours of study participants using a multi-method case study design. The aim of the peer mentoring intervention was to increase physical activity and exercise program adherence by positively influencing the perception of social support and self-efficacy beliefs. The current study aimed to increase our understanding of physical activity and exercise program adherence in low-income sedentary adults with chronic health conditions and to explore the impact of peer-mentoring as an intervention strategy to increase program adherence.
Chapter 2

Literature Review

This chapter reviews the literature relating to the physical activity and exercise behaviour of adults with chronic health conditions in low-income neighbourhood settings. The purpose of this review is to provide background information on the study population and to present a conceptual framework for the development and analysis of peer mentoring as an intervention strategy to increase exercise program adherence. The conceptual framework also provides direction for exploring and understanding the relationship between social support, self-efficacy, and physical activity behaviour.

Physical Activity Benefits

The health benefits of physical activity are well established and documented. In adults, participation in regular physical activity reduces the risk of cardiovascular disease, type 2 diabetes, hypertension, stroke, osteoporosis, osteoarthritis, depression, pain, breast and colon cancer, among other diseases and conditions (Dugdill, Crone & Murphy, 2009; Haskell et al., 2002; Nelson et al., 2007; Warburton et al., 2007). Furthermore, physical activity can play a substantial role in the treatment and management of various health conditions, including reduced morbidity and mortality from disease (Biddle & Mutrie, 2008; Bouchard et al., 1994; Nelson et al., 2007). Additionally, adults can derive emotional and psychological benefits from physical activity participation, including enjoyment, reduced stress and depression, self-confidence, cognitive function, sleep, and a greater sense of overall well-being (Biddle & Mutrie, 2008; Haskell et al., 2002; Warburton et al., 2007). Physical activity participation can reduce isolation and increase the perceptions of social support in adult populations (Biddle & Mutrie, 2008; Lox et al., 2006).
Physical Activity Trends

Variation in physical activity participation exists according to individual, social, and environmental factors (Armstrong, Bauman, & Davis, 2000; Burton, Turrell, & Oldenburg, 2003; Clark & Nothwehr, 1999; CLFRI, 2008; Gauvin, 2003; Lox et al., 2006; Resnick & Spellbring 2000). At the individual level, women are generally less active than men, and physical activity has been shown to decrease with age (CLFRI, 2008; Sallis & Owen 1999, Trost et al., 2002). A greater decline in physical activity participation is found in women in older age groups than in their male counterparts (CLFRI, 2008). Additionally, lower levels of physical activity are strongly associated with lower levels of education and income, and with existing disease (CFLRI, 2008; Clark & Nothwehr, 1999; Burton et al., 2003; Biddle & Mutrie, 2008; Dishman et al., 2004; Gauvin, 2003; Lox et al., 2006; Trost et al., 2002). Studies have also shown negative associations between neighbourhood deprivation and/or socioeconomic status and physical activity (Riva, Gauvin, & Barnett, 2007). Neighbourhood social and physical environments have been shown to facilitate or impede physical activity participation (McNeill, Kreuter, & Subramanian, 2006; Poortinga, 2006). Although the relationship between physical activity, health, and neighbourhood setting is complex and not fully understood, inactive individuals with existing health conditions in low-income settings are likely to benefit from interventions to enhance their physical activity and exercise program adherence.

There is strong evidence that low income is associated with lower levels of physical activity as well as poorer health in the Canadian population (CFLRI, 2008; Gauvin, 2003). Additionally, adults with chronic health conditions are at an increased risk of secondary health problems due to inactivity (Haskell et al., 2002; Nelson et al., 2007). Given that 71% of Canadian adults between the ages of 60 to 79 years have at least one chronic health condition, and more than one-third of these adults have co-morbidities (Broemeling, Watson, & Prebtani, 2008), it is
important to explore and understand ways to increase physical activity in adults with existing health conditions, most notably those in low-income neighbourhood contexts that are often underserved.

**Barriers to Physical Activity**

Physical activity is a complex, multi-dimensional behaviour, influenced by a number of factors that vary across population groups and contexts (Biddle & Mutrie, 2008; Sallis & Owen, 1997; Trost et al., 2002; Welk, 2002). Disparities in physical activity levels across populations suggest that the factors influencing physical activity participation may be unique to population subgroups (Biddle & Mutrie, 2008). The design of effective interventions for specific populations relies on the identification of context-specific barriers and facilitators to physical activity participation (Dishman, 1994). The factors that influence physical activity are often understood at three levels, including: (a) individual (biological, perceptions, beliefs, behaviours); (b) social environment (family, peers, social networks and support); and the (c) physical environment (i.e. accessibility, facilities, safety) (Giles- Corti & Donovan, 2002; Sallis & Owen, 1999; Trost et al., 2002).

The unique barriers to physical activity reported in low-income populations at the individual level include poor physical and psychological health, fear of pain and injury, and lack of knowledge about the benefits of regular physical activity (Burton et al., 2003; Clark, 1999; Dishman et al., 2004; King et al., 2002). At the environmental level, physical activity barriers for adults living on low-incomes include a lack of accessible and relevant programs and facilities, as well as the costs of programs and equipment (Biddle & Mutrie, 2008; Dugdill et al., 2009, Welk, 2002). At the social environmental level, low social support for physical activity has been identified as an important physical activity correlate in this population (Burton et al., 2003; Clark, 1999; Dishman et al., 2004; King et al., 2002).
Individuals living in low-income neighbourhoods with existing health conditions face further barriers to physical activity due to health status and symptoms, and the accessibility of tailored programs to meet specific health needs (Burton et al., 2003; Welk, 2002). Barriers to physical activity participation were identified in a sample of 729 low-income adult patients (aged ≥55 years, \( M = 67.9, SD = 8.6 \), 60.9% female) with various chronic health conditions including hypertension, diabetes, congestive heart failure, and coronary artery disease (Clark & Nothwehr, 1999). Pain was reported among 49% of the patients, as well as swelling (25%), fear of chest pain (22%), shortness of breath (30%), and falling (42%). Environmental barriers included weather (73%), crime (53%), having no place to sit down (42%), and limited or poor sidewalks (29%). In this study, each of the environmental barriers was more frequently reported among women than men. In addition, pain was reported more by women as a major barrier to physical activity participation. Women were also less likely to report regular exercise in this study (Clark & Nothwehr, 1999).

It is not clear which factors are most critical to target in the promotion of physical activity and exercise program adherence in adults with chronic health conditions in low-income settings. However, research supports that health behaviour is influenced by both external environmental factors, and individual thought processes (Anshel, 2006; Bandura, 1997; Biddle & Mutrie, 2008; Dishman et al., 2004; Lox et al., 2006).

**Self-Efficacy**

Multiple individual, social, and environmental factors have been linked to physical activity participation in adults (Trost et al., 2002). At the individual level, self-efficacy is one of the strongest and most consistent predictors of physical activity behaviours in both healthy and symptomatic populations (McAuley & Blissmer, 2000; McAuley & Mihalko, 1998; McAuley, Pena, & Jerome, 2001; Pender et al., 2005; Plotnikoff, Lippke, Courneya, Birkett, & Sigal, 2008;
Resnick et al., 2000; Sallis et al., 1992; Sherwood & Jeffery, 2000). Self-efficacy refers to an individual’s belief in his/her ability to perform specific actions to satisfy situational demands (Bandura, 1997).

In the exercise and physical activity domain, researchers have focused on different types of self-efficacy, such as confidence to execute a specific exercise activity (task-specific self-efficacy), and confidence to overcome barriers to exercise participation (self-regulatory self-efficacy). An individual’s perceived ability to walk for 30 minutes at a set pace is an example of one type of task-specific exercise self-efficacy, whereas the belief in the ability to walk for 30 minutes if the weather is bad is an example of barrier-based self-efficacy (Bandura, 1997; Blanchard, Rodgers, Courneya, Daub, & Knapik, 2002). The role of each of these types of self-efficacy will be discussed separately, as the two types of self-efficacy are distinct constructs (Bandura, 1997, McAuley & Mihalko, 1998) that have been shown to play different roles for physical activity behaviour (McAuley, Jerome, Elvasky et al., 2003; McAuley et al., 1993).

Moreover, it should also be noted that several approaches to measuring self-efficacy have been used within the literature with various populations. These include general and task-specific measures, confidence in physical attributes (e.g. strength), and confidence to perform different levels of exercise (McAuley & Mihalko, 1998). Despite the various exercise-related self-efficacy measures and diverse samples, the relationship between exercise-related self-efficacy and exercise behaviour is strong and consistent (McAuley & Mihalko, 1998).

**Exercise self-efficacy.** To date, research has primarily focused on exercise self-efficacy as a determinant and outcome of physical activity behaviour. Numerous studies have demonstrated that exercise self-efficacy beliefs are most influential in the initiation of physical activity, as well as long-term maintenance of activity after exercise program termination (McAuley et al., 1993; McAuley & Mihalko, 1998). In a study of 65 middle-aged sedentary
adults ($M=54$ years) who participated in a 5-month exercise program, exercise self-efficacy (combined task and self-regulatory measure) significantly predicted exercise attendance and intensity over the first 3 months of the exercise program. Exercise self-efficacy did not significantly predict attendance at 5 months (McAuley, 1992). McAuley conducted a 4-month follow-up study and found that exercise self-efficacy predicted exercise behaviour over the follow-up period when controlling for previous exercise capacity and behaviour (McAuley, 1993). Using a multiple regression analysis, self-efficacy was the only significant predictor of overall exercise behaviour, predicting 12.5% ($p<.01$) of the unique variance in continued exercise participation after program termination (McAuley, 1993). Later studies by McAuley and colleagues (McAuley et al., 2003, 2005, 2007) have shown physical activity to be predicted by efficacy beliefs at 6-month, 18-month, and at 54 month (5 year) post-exercise program termination (McAuley et al., 2003, 2005, 2007). In congruence with self-efficacy theory (Bandura, 1997), these findings strongly suggest that self-efficacy plays its most influential role when physical activity is most challenging, such as adopting physical activity as a new behaviour, and continuing the behaviour after program termination (McAuley et al., 2003, 2005, 2007).

Exercise self-efficacy is a significant predictor of exercise behaviour in many diseased populations, including those with osteoarthritis (Litt, Kleppinger, & Judge, 2002; Rejeski, Ettinger, Martin, & Morgan, 1998); fibromyalgia (Culos-Reed & Brawley, 2000); cardiac disease (Allison & Keller, 2004; Bray & Cowan, 2004; Sniehotta, Schlz, Schwarzer, 2005); chronic health failure (Oka et al., 1996); obstructive pulmonary disease (Belza et al., 2001); arthritis (Gecht, Connell, Sinacore, & Prohaska, 1996); and multiple sclerosis (Stroud, Minahan, & Sabapathy, 2009). Similar to studies with asymptomatic populations, physical activity and self-efficacy were measured differently in each of these studies. Measurements include the use of various self-report questionnaires, accelerometers, and fitness tests. In most of these studies,
individual self-efficacy was measured using an exercise self-efficacy scale that was either disease-specific and/or exercise-specific in nature. For example, Belza et al. (2001) used a walking self-efficacy questionnaire to assess the perceived level of activity that patients with chronic obstructive pulmonary disease believed they had the ability to accomplish. This tool included nine statements that described increased levels of walking intensity. Physical activity was measured using an accelerometer in combination with the Modified-Activity Recall Questionnaire. Fitness was also assessed using a 6-minute walk test and other fitness indicators (Belza et al., 2001). Accelerometer physical activity was reported by Belza et al., (2001) to be associated with walking self-efficacy ($r=0.27, p<0.05$) in this study. The 6-minute walk test was strongly associated with walking self-efficacy ($r=0.68, p<0.01$).

Other studies have used an exercise self-efficacy scale specific to the health condition in question. For example, Oka et al. (1996) used a self-efficacy expectation scale which included a corresponding activity checklist used to assess self-efficacy beliefs for physical activity specific to cardiac recovery behaviours. The instrument consisted of 17 items that assessed activities of daily living for cardiac recovery patients. Physical activity was assessed using the Duke Activity Status Index, a 12-item questionnaire that assessed ability to participate in activities such as walking at different intensities and housework. A treadmill VO2 test was used to assess physical fitness (Oka et al., 1996). A moderate association was found between self-efficacy for physical activity and the Duke Activity Status Index score ($r=0.46, p=0.003$). In this cardiac population, the study model, which included fitness, knowledge, attitudes, beliefs, perceived exertion, social support and self-efficacy, explained 38% of the variance ($p<0.001$). Self-efficacy was the strongest predictor of physical activity in this study ($p=0.015$; Oka et al., 1996).

Exercise self-efficacy has been shown to decrease with increasing age and decreasing income (Clark & Nothwehr, 1999; Jenkins & Gortner, 1998; Resnick, Palmer, Jenkins, &
Women have also been found to have lower self-efficacy than men at the onset of an exercise program (McAuley & Courneya, 1993). Other studies have found no significant relationship between age or gender and self-efficacy (Clark, 1999; Resnick & Spellbring, 2000).

**Exercise barrier self-efficacy.** Many major reviews of task-related exercise self-efficacy have demonstrated its positive association with physical activity participation (McAuley & Blissmer, 2000; McAuley & Mihalko, 1998; McAuley, Pena, & Jerome, 2001). Barrier-based (i.e. self-regulatory) exercise self-efficacy has received much less attention in physical activity research (McAuley, Jerome, Marquez et al., 2003). Bandura (1997) suggests that self-regulatory efficacy is crucial to behaviour change, including physical activity adoption and maintenance (Bandura, 1997). Whereas exercise self-efficacy has proven to be most influential in the adoption and long-term maintenance of physical activity, exercise barrier self-efficacy has been shown to be more important in the maintenance stage of exercise behaviour (McAuley et al., 1993, 2003). According to Bandura (1997) and McAuley (1992, 1993), lower exercise barrier self-efficacy is associated with poor adherence to exercise programs. Moreover, it has been shown that individuals with low barrier self-efficacy also have less ability to maintain regular exercise outside of structured exercise programs (Bandura, 1997; McAuley, 1993). A study by McAuley and colleagues demonstrated that adults who had higher barrier self-efficacy were more successful at maintaining their exercise as well as their cardio respiratory fitness (McAuley et al., 1993). In a study of 98 Phase II cardiac rehabilitation patients (50 men, $M=58.68$ years; and 48 women, $M=61.75$ years), Blanchard and colleagues found that exercise was positively associated with barrier efficacy for men ($r=.58, p<.01$), and women ($r=.37, p<.05$; Blanchard, Rodgers, Courneya, Daub, & Black, 2002). Women had lower task and barrier self-efficacy than men when they initiated the exercise program; however, changes in self-efficacy were larger in women than
men from pre to post exercise program (Blanchard et al., 2002a). Consistent with other research, both task and barrier self-efficacy declined post-program when adult participants had to exercise on their own (Blanchard et al., 2002a; Millen & Bray, 2008).

In a subsequent analysis of these data, it was shown that men had significantly higher exercise adherence and barrier self-efficacy than women (Blanchard et al., 2002b). The researchers were also able to show that barrier efficacy mediated the gender-exercise adherence relationship. Blanchard et al. (2002b) suggest that enhancing women’s confidence to overcome barriers is a possible strategy to increase their exercise adherence. The researchers suggest that self-efficacy can be influenced by manipulating the four sources of self-efficacy information proposed by Bandura: mastery experiences, vicarious experiences, social persuasions, and physiological and affective states (Bandura, 1997; Blanchard et al., 2002b). The four sources of self-efficacy will be discussed further in subsequent sections.

**Self-efficacy as an outcome.** Given the strong and consistent relationship between self-efficacy and physical activity, it has been suggested that self-efficacy should be targeted and manipulated as an *outcome* of physical activity interventions (Ashford, Edmunds, & French, 2010; McAuley et al., 2001; McAuley, Talbot, & Martinez, 1999; Jerome et al., 2002). Exercise trials have demonstrated self-efficacy to be a consequence of exercise participation (McAuley & Blissmer, 2000; McAuley et al., 1991; McAuley et al., 1993; McAuley & Mihalko, 1998). This finding is consistent with Bandura’s theorized influence of mastery experience on self-efficacy beliefs (Bandura, 1997). Mastery experience is personal experience with the successful performance of a task (Bandura, 1997). Both the exposure to acute bouts of exercise (McAuley & Coruney, 1993; McAuley et al., 1991; McAuley et al., 1993) and long-term exercise enhanced perceptions of self-efficacy in middle-aged adults, with more dramatic effects for the latter dose
(McAuley et al., 1993). Thus, it is suggested that getting adults to initiate exercise can be a means to increasing their exercise self-efficacy (McAuley et al., 1993).

Self-efficacy beliefs can also be manipulated during exercise. McAuley et al. (1999) manipulated self-efficacy information within a laboratory setting by providing either high-efficacy or low-efficacy information prior-to and after a bout of exercise. This information was reinforced at a subsequent exercise session. Participants in the high efficacy condition increased efficacy beliefs, whereas those in the low-efficacy condition decreased efficacy. These changes in self-efficacy were maintained over the course of the second exercise session, reinforcing that self-efficacy was effectively manipulated (McAuley et al., 1999). In another study, Turner and colleagues (1997) targeted self-efficacy beliefs via the manipulation of exercise instructor leadership style. By introducing two leadership styles, the researchers aimed to create two experimental conditions: a socially supportive exercise environment, and a bland social exercise environment. Self-efficacy was targeted via reinforcement, feedback, and encouragement. The researchers reported significantly greater increases in self-efficacy in the socially supportive exercise environment. In both of these studies, increases in self-efficacy were also associated with more positive affective states such as less fatigue and psychological distress (McAuley et al., 1999) and revitalization (Turner et al., 1997). These studies are relevant to the current study as they indicated that the social environment in which one is active can positively influence self-efficacy beliefs as well as affective states. In addition, self-efficacy can be reliably manipulated within the exercise environment.

Social Support

Augmenting social resources and strengthening social support is a primary health promotion strategy (Dugdill, Crone & Murphy, 2009; World Health Organization, 1986). Evidence indicates that individuals with good social support live longer, healthier, and happier
Social support has been variously conceptualized and measured in health promotion research, but it generally includes “the emotional support, advice, guidance, and appraisal, as well as the material aid and services that people obtain from their social relationships” (Ell, 1984, p. 134). The concept is often used broadly to refer to processes through which social relationships provide material, psychological, and symbolic resources that promote health and well-being (Cohen et al., 2000). As a physical activity correlate, social support is usually defined in terms of the social influence of individuals on the physical activity of others (Biddle & Mutrie, 2008). Although there is no universal definition of social support, the concept is generally delineated and approached from either a structural or functional perspective (Cohen et al., 2000). It has been suggested that physical activity interventions should build and strengthen support for physical activity in adults, as these strategies have been shown to be effective in the past (Resnick, Orwig, Magaziner & Wynne, 2002; Kahn et al., 2002).

It has been consistently demonstrated that social support is an important correlate of various physical activity behaviours, especially in women (Carron, Hausenblas, & Mack, 1996; Chogaraha, Cousins, & Wankel, 1998; Dowda, Ainsworth, Addy, Saunders, & Riner, 2003; Kahn et al., 1995; McAuley et al., 2003; Rhodes et al., 1999; Rovniak, Anderson, Winett, & Stephens, 2002; Sherwood & Jeffery, 2000; Trost et al., 2002). According to a review of physical activity determinants by Trost and colleagues (2002), “every study that included a measure of social support for physical activity found a significant positive association.” For example, in the U.S Women’s Determinant Study (Eyler, et al., 1999), middle-aged and older women with the highest levels of emotional support for physical activity from family and friends were approximately two times as likely as women with low perceived support to be active enough to achieve health
benefits (Eyler et al., 1999). Physical activity in this study was measured by self-reported frequency in minutes of physical activity participation (Eyler et al., 1999).

Social support has also been positively linked to more specific outcomes in the exercise setting, such as uptake and adherence to exercise programs (Biddle, 2008; Duncan, McAuley & Duncan, 1993), frequency of participation in exercise programs (Okun, Ruehlman, Karoly, & Lutz, 2003), physical activity levels (Dunn et al., 1997) and energy expenditure during exercise programs (Dishman et al., 2004; Dowda et al., 2003; Dunn et al., 1997; Rovniak et al., 2002).

In a meta-analysis on the impact of social influences on exercise behaviour (Carron, et al., 1996), the authors concluded that social support by friends, family, and credible others (such as doctors and exercise instructors) is important for exercise adoption and adherence (Carron et al., 1996). In a recent study of 189 women ($M=67.4$ years) with low bone density it was found that social support was the only significant predictor of exercise behaviour at 12 months, with exercise self-efficacy and other psychosocial variables included in analysis (Litt et al., 2002). Those with higher perceived social support for exercise at 12-months exercised significantly more days than those with lower perceived support ($B=0.15$, $SE=0.06$, $Beta=0.39$, $t=2.30$, $p<0.05$). The authors suggest “regardless of levels of self-efficacy or social support at baseline, if people have social support for their behaviour after they have started, then they have a better chance of committing to a continuous regimen” (Litt et al., 2002, p. 95).

In a comprehensive systematic review of the effectiveness of physical activity interventions, Kahn and colleagues (2002) concluded that “there is strong evidence that social support interventions in community settings are effective in increasing levels of physical activity” (p. 85). Intervention studies included in the systematic review used companionship, emotional, and informational support strategies via one-on-one, group, and telephone-meditated methods.
(Kahn et al., 2002). Changes in physical activity were measured as time spent in physical activity, change of frequency, and change in fitness (Kahn et al., 2002).

Many studies are limited in their conceptualization of social support. For example, in the study conducted by Eyler and colleagues, social support was conceptualized as encouragement given from family and friends, which is one type of social support that has been identified to be influential to health behaviour (Cohen et al., 2000; Uchino, 2004). The social support interventions reviewed by Kahn and colleagues (2002) were not based on social support theory, and did not explore the multiple domains of social support that may be related to physical activity in adults. The systematic review did not include any studies of the role of peer mentoring social support on physical activity and exercise program adherence in an adult population. Additionally, most studies measure social support in a structural manner, in which number of contacts of participants within social networks is analyzed, rather than the functions that relationships can serve for physical activity participation (Lox et al., 2006). The functional nature and the resources that others can provide are of interest for strengthening self-efficacy in the exercise setting and increasing exercise program adherence. Although studies have provided clear evidence that different measures of social support influences physical activity and exercise program participation, less is known about how types social support facilitate exercise program adherence in specific populations within the exercise setting.

Summary

The bulk of research that has addressed self-efficacy and social support for physical activity has been purely quantitative in nature. Research has focused on examining the extent to which self-efficacy and social support affect physical activity/exercise, rather than identifying how social support influences self-efficacy beliefs and physical activity behaviour in the exercise setting. Although these methods are useful, they mask the perceived contextual factors and social
support functions that are consequential to the four sources of self-efficacy beliefs and subsequent physical activity behaviour and exercise program adherence. An understanding of the contextual factors that influence social support and self-efficacy can assist with future exercise program to promote exercise program adherence in the target population. To the researchers’ knowledge, peer mentoring has not been researched as an intervention strategy to influence self-efficacy and exercise program adherence in an adult population. Therefore, the current study aims to fill this gap in the social support and physical activity health promotion literature.

Exploratory mixed-methods inquiry can provide an understanding of the sources of self-efficacy for a given population and of how the sources can be targeted during social support interventions to promote exercise program, adherence. In particular, a qualitative interview approach can enable researchers to investigate interpretations of self-efficacy sources in a social support intervention context as well as an exercise setting, and the influence of social support on these processes.

In summary, adoption of and adherence to physical activity can have substantial health benefits for adults with chronic health conditions living in low-income neighborhoods. Social support may be a key factor for the effective promotion of physical activity and exercise program adherence because of its direct influence on physical activity behaviour, as well as its indirect influence on physical activity and exercise behavior via its influence on self-efficacy beliefs. Little is known, however, as how best to structure social support or self-efficacy interventions to facilitate physical activity and exercise program adherence in the target population: adults with chronic health conditions participating in an exercise program in a low-income neighborhood. A better understanding of the influence of social support, self-efficacy, and other barriers and facilitators to physical activity will add to the health promotion literature as well as to health benefits for adults with chronic health conditions living in low-income neighborhoods.
promotion practice. Peer mentoring is a possible strategy to increase physical activity and exercise program adherence that has not been researched in this population.
Chapter 3

Conceptual Framework

The use of a conceptual framework is critical for guiding the development and understanding of physical activity interventions. The following framework is outlined as a rationale for the development of peer mentoring as an intervention strategy, as well as for the analysis of social support, self-efficacy and physical activity in the study population. Although the multiple mechanisms underlying physical activity and exercise program adherence are not well understood, research suggests that enhancing social support and self-efficacy holds promise.

**Conceptualizations of Social Support**

Social support is a multidimensional concept that has been defined and measured in a variety of ways. It is important to distinguish and define the components of social relationships because of the complexity of conceptualizations of social support, the processes in which social support influences health behaviour, and the ways in which it can be measured (Uchino, 2004).

**Structural social support.** Structural social support refers to various quantitative measures of the size, frequency, and density of social networks (Taylor, 2007; Uchino, 2004). These studies are indirect measures of social support and health, as they aim to quantitatively describe the channels through which social support can be provided, but do not refer to the quality of these channels or supportive resources provided by others (Stroebe and Stroebe, 1996; Uchino, 2004). One limitation of current social support and physical activity studies is that most use a structural conceptualization of social support. That is, many studies measure the number of contacts an individual has and how this number is associated with varying levels of physical activity among individuals, rather than measuring the various functions that relationships can serve for physical activity, and how the mechanisms of social support work (Cohen et al., 2000;
Uchino, 2004). Thus, little is known about how social support via peer mentoring and support provided in exercise programs from different sources can influence physical activity levels in the target population.

**Functional social support.** In contrast to the structural conceptualization of social relationships and health, functional conceptualizations emphasize the quality of supportive resources provided by social support and the functions that a supportive relationship can serve an individual (Stroebe and Stoebe, 1996; Uchino, 2004). There are many typologies of support functions put forth by social support researchers and theorists. Within the different typologies, social support is usually defined in terms of emotional, informational, and material support (Stroebe & Stroebe 1996; Uchino, 2004). Briefly, emotional support is the expression of caring, concern, and empathy towards an individual’s attempt to be physically active. Informational support includes information, advice, and guidance concerning physical activity. Material support is direct and tangible help, such as material aid or driving a friend to their physical activity program (Biddle & Mutrie, 2008; Stroebe & Stroebe, 1996).

**Social Support Effect Models**

Different theoretical models have been used to study the influence of social support on health outcomes, each of which complements the others (Uchino, 2004). It is useful to use social support models to guide intervention research as they provide a conceptual understanding of the pathways through which social support can influence physical activity. Most models linking social support to health and health behaviours are variants of two types of models: buffering-effect and direct-effect models.

**Buffering Effect Model.** Buffering effect models postulate that social support is beneficial because it protects individuals from potentially harmful effects of stress on health (Cohen et al., 2000; Uchino, 2004). This has been shown to have the greatest impact on
individuals who have highly stressful life conditions, such as living in low-income settings (McLeod & Kessler, 1990). Within this model, social support can buffer the influence of stress by helping to redefine stress, by providing coping resources and strategies, and by inhibiting maladaptive responses to stress (Dennis, 2003). However, functional resources of social support can positively influence health independently of stress (Uchino, 2004). The health promoting influence of social support independent of stress provides a basis for examining the influence of perceived social support via peer-mentoring and within exercise class social support using a direct and mediating-effect model.

**Direct effect model.** Functional support such as emotional, informational, and material resources can have a direct effect on exercise behaviour (Resnick et al., 2002). For example, an individual who tells a friend where to exercise (information support) and then drives her to the facility (tangible support) are examples of social support for physical activity. This example of the provision of functional support would directly influence the physical activity behaviour of the recipient by increasing the likelihood that the individual receiving support would exercise on that given day.

**Mediating effect model.** Social support can also have an indirect influence on exercise behaviour through emotions, cognitions and behaviours (McAuley, Jerome, Elavsky et al., 2003; Rovniak et al., 2002). Social support has consistently been shown to indirectly influence exercise by strengthening self-efficacy related to exercise (Ayotte et al., 2010; Duncan & McAuley, 1993; Duncan et al., 1993; McAuley, Jerome, Elavsky et al., 2003; McAuley, 1993; Resnick et al., 2002). Within the Social Cognitive Theory, Bandura also argues that self-efficacy serves a mediational role in the relationship between social support and exercise (Bandura, 1997). For example, in a 6-month randomized control exercise trial with 174 previously sedentary, older adults (mean age=66 years), McAuley and colleagues (2003) reported that self-efficacy and social
support were highly correlated. These results supported earlier findings about the relationship between social support, self-efficacy and physical activity (Duncan et al., 1993; Duncan & McAuley, 1993; Rovniak et al., 2002) and Bandura’s hypothesized relationship between the two variables in his Social Cognitive Theory (Bandura, 1997). Interestingly, social support also influenced physical activity behaviour via positive affective experience in McAuley and colleagues’ study. Individuals with greater levels of perceived social support within the exercise setting reported more positive feelings about their exercise participation (McAuley, Jerome, Elvasky et al., 2003). Social support provided by peers (peer mentor and co-exercisers) may modify individual self-efficacy through its influence on the sources of self-efficacy. As one example, peer support may influence the perceived enjoyment of an exercise program (affective state), that in-turn may lead to increased confidence to participate in the program (self-efficacy to adhere).

Figure 1. Social support effect model
Conceptualization of Peer Mentoring

Peer. The concept of peer support has been simplistically defined as “the giving of assistance and encouragement by an individual considered an equal” (Dennis, 2003, p. 324). The peer is a potential source of support, internal to the social network of the recipient. Peers are ‘equal’ in that they share demographic similarities as well as similar experiences (Uchino, 2004). Peer support has been successfully manipulated by health professionals to address many needs, such as behavioural management, coping skills, and adjustment to different disabilities and diseases (Cohen et al., 2000; Dennis, 2003; Uchino, 2004). Health promotion practices that apply social support strategies often focus on the diffusion of information, encouragement and emotional counseling (Dennis, 2003). Peer support can be provided through multiple modes of interaction, such as support groups, or one-on-one interactions. Support can be provided face-to-face or mediated through technology, and can also occur in various provider settings. Examples of health promotion efforts that include peer support components have been used in programs to prevent acquired immunodeficiency syndrome (HIV/AIDS) and sexually transmitted infection, and programs about smoking cessation, nutrition, and physical activity counseling (Cohen et al., 2000; Dennis, 2003; Uchino, 2004).

Mentor. A mentor is usually an older, more experienced person who seeks to guide a younger individual in acquiring the skills and knowledge in which the mentor is already proficient (Cohen et al., 2000). The example of the Big Brothers/Big Sisters mentoring model is a typical form the mentoring relationship. Guidance is usually accomplished through modeling, instruction, challenge and encouragement. The mentor strives to assume the role of advisor, teacher and friend (Cohen et al., 2000). Peer mentoring, however, is provided by a non-professional peer within the recipient’s social network. With the concepts of ‘peer’ and ‘mentor’ together, the peer mentor is a similar and equal individual who understands the situation of the
support recipient, and also possesses practical knowledge and skills derived from personal experience that can be used to help the recipient overcome their situation.

**Self-Efficacy Theory**

Self-efficacy is one of the most frequently applied approaches to facilitating health behaviour change (Biddle & Mutrie, 2008 McAuley & Blissmer, 2000). Perceived self-efficacy is defined by Bandura (1997) as the “belief’s in one’s capabilities to organize and execute the courses of action required to produce given attainments” (1997, p. 3). The theory of self-efficacy is a social cognitive approach within the larger and more comprehensive Social Cognitive Theory (McAuley & Blissmer, 2000; Resnick, 2002).

According to Social Cognitive Theory, behaviour is the product of reciprocal influences of personal, behavioural, and environmental events (Bandura, 1997, 2001). The theory proposed by Bandura illustrates how individuals actively seek and interpret information. Within Social Cognitive Theory (Bandura, 1997), motivation and subsequent action is based largely on self-efficacy beliefs.

Bandura’s self-efficacy theory describes how individuals weigh, evaluate and integrate information about perceived capabilities before making choices and initiating effort (Bandura 1986, 1997). A central component of self-efficacy theory is that the stronger an individual’s belief in her ability to perform a specific task, the more likely she is to initiate and persist with the task in the face of challenges to it (Bandura, 1997). Self-efficacy is a critical determinant of health behaviour as it plays a major role in behaviour modification, behaviour change, the adoption of new behaviours, as well as the maintenance of these behaviours (Bandura, 1997). Bandura theorizes that efficacy beliefs influence behaviour through a variety of processes, such as the choice and initiation of activities, the amount of effort directed at an activity, and the level of persistence in the face of challenges and failures (Bandura, 1997). For example, an efficacious
individual will be more likely to initiate the specific behaviour and direct high levels of effort and persistence in light of challenges to the behaviour compared to a less efficacious individual. An individual who has low self-efficacy may shy away from the specific task at hand, or give up the task in the face of challenges to it (Bandura, 1997).

Bandura postulates that self-efficacy is a primary health determinant because it influences performance directly, as described above, as well as indirectly by its influence on motivation, thought patterns, and affective states (Bandura, 1997). Self-efficacy influences emotional reactions and causal thinking (Bandura, 1997). For example, individuals with low self-efficacy may dwell on deficiencies and difficulties and may believe that failure is attributable to lack of skill. This belief may lead to an individual easily giving up because they do not believe in their personal ability to perform the task (Bandura, 1997). In contrast, highly efficacious individuals are more likely to approach challenges, increase efforts, change strategies, and remain calm in the face of negative outcomes (Bandura, 1997). Failure is less likely to be attributed to lack of skill in highly efficacious individuals (Bandura, 1997).

**Barrier and exercise self-efficacy.** Self-efficacy perceptions are usually considered to be situation and task-specific (Bandura, 1997). In other words, self-efficacy involves individual beliefs about specific abilities needed for a given behaviour in a specific context. There are two main types of self-efficacy in the exercise/physical activity domain, including exercise efficacy, and barrier-based exercise self- efficacy (Bandura, 1997). **Exercise efficacy** is one type of task self-efficacy which refers to one’s beliefs about his or her abilities to successfully engage in specific levels, frequencies, and durations of physical activity (Feltz, Short, & Sullivan 2008; McAuley & Mihalko, 1998). **Exercise barriers efficacy** is one type of self-regulatory self-efficacy, and refers to the belief that one can successfully overcome social, personal, and environmental barriers to physical activity (Bandura, 1997; Feltz, et al., 2008). Levels of efficacy
beliefs in a given individual can range across the subtypes of self-efficacy. For example, one might have great confidence in his or her ability to run for thirty minutes (exercise self-efficacy), but lack confidence to run if it is windy outside (barrier self-efficacy). There is a strong body of research on diverse populations supporting exercise self-efficacy and exercise barrier self-efficacy as important predictors of exercise adherence (McAuley & Mihalko, 1998; McAuley & Blissmer, 1999; Sallis & Owen, 1999; Feltz et al., 2008).

**Sources of self-efficacy information.** Bandura’s self-efficacy theory (1997) suggests that efficacy beliefs are a product of a complex process of selection, interpretation, and integration of four sources of information: (a) mastery experiences, or one’s previous performances; (b) vicarious experience, or learning from others; (c) verbal persuasion, or encouragement received from others; and (d) one’s physiological responses such as arousal, anxiety, mood, and fatigue (Bandura, 1997).

Mastery experiences information is obtained from perceived successes or failures with a task. For example, if an individual has performed well at running a marathon in the past, he/she is more likely to feel competent in his/her ability to run a similar marathon (Bandura, 1997). He/she is also likely to work hard to accomplish the marathon compared to an individual with little mastery experience. Mastery experience information is the most influential determinant of self-efficacy beliefs because it is direct evidence of personal and authentic ability to perform a task successfully (Bandura, 1997). Thus, a strong sense of self-efficacy can be developed with repeated success experiences with a given task. By the same token, performance failures are likely to decrease self-efficacy (Bandura, 1997).

Vicarious experience information is influenced by observed modeling of a similar task by someone else. Individuals can judge their own performances or gauge their own abilities by comparing them to those of similar others. In fact, Bandura theorizes that the extent to which
vicarious experience information influences self-efficacy depends on the individual’s perceived similarity to the model. Similarity includes similar characteristics, competencies and abilities (Bandura, 1997). For example, an adult with a health condition, low fitness level, from a low-income setting would be more influential to a person with similar characteristics than would a young, fit exercise instructor from a high income setting. However, the role model can also have a negative impact on self-efficacy if the individual interprets the model’s failure of a task as self-efficacy information. The observer may worry and question their own abilities to succeed at the task if a similar other was perceived to fail (Bandura, 1997).

Verbal persuasion is related to encouragement and discouragement pertaining to an individual’s ability to perform a task. Words of encouragement can lead people to believe that they can be successful, and thus influence them to put forth great effort towards task accomplishment. Negative feedback focused on failure, however, can undermine efficacy beliefs. If verbal persuasion is negative, an individual is more likely to doubt their ability to succeed (Bandura, 1997). As with vicarious experience, the level of perceived similarity and credibility of the source is proposed to directly influence the effectiveness of verbal persuasion (Bandura, 1997).

Lastly, intrapersonal physiological and affective states refer primarily to emotions and physiological sensations, such as pain and fatigue that can affect self-efficacy beliefs. In general, more positive emotions or interpretations of physiological states are associated with higher self-efficacy, whereas negative emotions or interpretations of physiological states are associated with lower self-efficacy (Bandura, 1997). For example, an individual may perceive an elevated heart rate as indicative of a lack of fitness and may interpret this as his or her inability to succeed at the task. A more positive interpretation of this physiological information could be that an elevated heart rate indicates good effort. This could lead to an increase in self-efficacy. Other individuals
can influence this source of self-efficacy by assisting with the interpretation of the feedback information.

Bandura’s theory of self-efficacy proposes that the four sources of self-efficacy can work exclusively or interact with each other to influence an individual’s self-efficacy for a given behaviour (Bandura, 1997). It is theorized that peer relationships and perceived support can modify an individual’s efficacy beliefs by influencing these sources of self-efficacy information.

**Peer support on efficacy cognitions.** The functional resources commonly demonstrated as peer support (emotional, informational, and material support) are consistent with the sources of information from which Bandura theorizes self-efficacy is strengthened (Bandura, 1997).

Within the mediating effect model of social support, peer mentoring can indirectly influence physical activity by influencing the interpretation of successful performance and positively reinforcing performance accomplishments (mastery experience); providing a credible source of encouragement and by reinforcing co-exercisers’ abilities (social persuasion); providing opportunities for observational learning and the sharing of information (vicarious experience); and, by assisting with the positive interpretation of physiological responses, and/or teaching coping strategies (physiological states; Bandura, 1997; Dennis, 2003).

Social support for physical activity via peer mentoring has the potential to be an effective and cost-efficient strategy to improve exercise program adherence, physical activity, and well-being in adults living with existing health conditions in low-income settings; however, this intervention strategy has not been researched for these particular intervention aims in this specific population. The current study aims to fill this research gap, as well as explore social support and self-efficacy within the exercise setting, and barriers and facilitators of physical activity for sedentary adults with chronic health conditions participating in a community-based exercise program.
Purpose

The purpose of this study was to explore the influence of social support and self-efficacy on the physical activity beliefs and behaviours of participants in a peer-mentoring intervention embedded in a community-based exercise program. The exercise program was designed for sedentary adults with chronic health conditions in a low-income neighborhood. This study also sought to explore perceived social support and self-efficacy within the exercise program, and barriers and facilitators to physical activity for the study population. To understand the physical activity beliefs and behaviours of participants and the impact of peer mentoring, a self-efficacy and social support conceptual framework was used.

Research Questions

The primary research question was:

- What is the influence of peer mentoring in relation to social support, self-efficacy, physical activity, and exercise program adherence for intervention participants?

The two secondary research questions were:

- What is the influence of social support and self-efficacy on the physical activity beliefs and behaviours of adults with chronic health conditions participating in a community-based exercise program?

- What are the perceived barriers and facilitators of physical activity participation of adults with chronic health conditions participating in a community-based exercise program?

Based on existing literature, it was proposed that peer mentoring would positively influence perceived social support and self-efficacy and thus positively influence physical activity and exercise program adherence for intervention participants.
Reflexivity

The choices I have made in relation to this study were undoubtedly influenced by my past experiences and perceptions, as well as my experiences ‘in the field’. I applied to the Health Promotion program at Queen’s University knowing that I wanted to complete a community-based research project with a ‘disadvantaged’ population. I attribute this desire to my undergraduate studies in Sociology and volunteer experiences with various underserved populations. Together, these experiences heightened my awareness of the inequality of health and my passion to address health inequalities with the promotion of physical activity. This is the direction I wanted my academic studies and my future career to go. It wasn’t until I began my study with the ‘Reach’ exercise program that I knew that both my perceptions and study methods would change.

A randomized control trial is the gold standard...right?

One year ago I proposed a experimental research design aimed to test the effectiveness of peer mentoring by statistically assessing its impact on study variables between randomized intervention groups. I knew there was a possibility that I would include a qualitative component to this design, but I wanted to try something that I hadn’t done before (and attempt an approach to intervention research that is held in high regard by the science community). I was unaware of how important the qualitative component of the current study was until I participated in the ‘Reach’ exercise program and began to understand the complexity of physical activity for study participants within their context. After a data collection session at 6-weeks, two of the study participants told me I was going about my research wrong: ‘why don’t you just ask us what our experiences are? We’ll tell you’. They were right. Qualitative interviews had the potential to enhance our understanding of physical activity and exercise program adherence, as well as the impact of peer mentoring. The current study’s research questions and methods reflect these experiences and the decisions I have made along the way. I am grateful for my experience with
the participants of the current study and KCHC staff and would like to acknowledge the role they played on my perceptions of social research and health promotion. I acknowledge that being a young, healthy, educated, middle-class woman influences my perceptions, biases, and decisions. I attempted to present research findings in a way that reflected the experiences and perceptions of study participants. I hope that I have done justice to them.
Chapter 4

Methods and Procedures

Context and Overview

The current study was a collaborative effort on behalf of the researcher, her supervisors, and Kingston Community Health Centers (KCHC). The ‘Reach… Your Personal Best!’ program (known to participants and staff as ‘Reach’) was developed and implemented by KCHC for sedentary adults with chronic health conditions and/or disabilities living in the north Kingston community. The north Kingston catchment area includes mostly low-income neighbourhoods (Melles & Cleary, 2010). During the first meeting with KCHC staff, we were informed of the low physical activity levels in this target population, as well as the difficulties KCHC staff was having retaining participants in the ‘Reach’ exercise program. This issue provided a unique research opportunity as it was community-identified and aligned with the researchers’ interests. The researchers proposed the idea of implementing a peer mentoring intervention as a cost and resource-effective strategy to potentially influence the physical activity participation and exercise adherence of ‘Reach’ participants. The peer mentoring strategy was based on a recommendation by the Canadian Association for the Advancement of Women and Sport and Physical Activity (CAAWS) to enhance physical activity in low-income women. This recommendation was based on nation-wide focus group findings from low-income women (Canadian Association for the Advancement of Women and Sport, 2009). This meeting marked the beginning of the partnership with the KCHC as well as the beginning of the current project.

Collaboration between the health care staff and academic researchers during the current study included the following research and program delivery processes: identifying priority areas and research needs; intervention planning; access to the study population and recruitment
strategies; building trust and rapport with participants; intervention implementation and data
collection; interpretation of observations and preliminary findings; and dissemination of research
findings. The processes are included in the following sections.

**Permission**

The current study was approved by the General Research Ethics Board of Queen’s
University and followed strict ethical standards, procedures, and expectation as per Tri Council
Policy.

**Design**

Miles and Huberman (1994) define a case as “some phenomenon embedded in a single
social setting” (p. 27). For the current study, the researcher investigated and analyzed the factors
that influence the physical activity beliefs and behaviours of participants within a particular
exercise program and setting. The case, then, is the physical activity beliefs and behaviours of
participants. The impact of the peer mentoring intervention is a subunit of analysis. According to
Yin (2000), the current study design is a case study with embedded units of analysis, and affords
the exploration of the intervention situated within the larger case of physical activity beliefs and
behaviours of program participants. Analysis of the outcomes of the intervention for intervention
participants as a sub-unit is discussed in terms of the overall case: physical activity beliefs and
behaviours of participants within the exercise program using a self-efficacy and social support
theoretical framework.

A case study design (Yin, 2009) was chosen because physical activity is a complex
behaviour influenced by intrapersonal, interpersonal, and environmental factors (Biddle &
Mutrie, 2008; Trost et al., 2002). Case studies offer the possibility to explore and include many of
the interacting factors grounded in the study context (Merriam, 2009; Yin, 2009). The complexity
of these factors is likely not easily captured using one source of data (e.g., quantitative survey data); the case study design allows for the use of mixed-methods.

**Program and Study Recruitment**

The ‘Reach…Your Personal Best!’ program (a.k.a. ‘Reach’) is offered to sedentary adults (≥20 years) from the north Kingston community who has at least one existing chronic health condition as determined by a healthcare professional. The ‘Reach’ maintenance exercise program is for adults who have completed at least one rotation of the beginners ‘Reach’ class with regular attendance, and have surpassed the beginners ‘Reach’ class level of difficulty.

Recruitment methods occurred in two phases: (1) community members were recruited into the ‘Reach’ program and (2) participants currently enrolled in the ‘Reach’ program were recruited into the study. Below is a description of each phase.

**Program Recruitment.** The KCHC promotes and advertises each rotation of the ‘Reach’ program in community newspapers, community centers and associations, and health care provider locations. Individuals are also referred into the ‘Reach’ program by health care practitioners. The majority of referrals for the ‘Reach’ program come internally from the KCHC health care providers and doctors, on-site diabetes education nurses, occupational therapist, and dieticians. The KCHC promotes the program year-round, with more emphasis on recruitment closer to each start date of a new rotation of the program.

Between September 17th and September 24th 2010, the researcher and research assistants distributed approximately one thousands flyers advertising the ‘Reach’ program (Appendix A) door-to-door to houses and apartment buildings in the north Kingston community, as well as at food banks, grocery and convenience stores, flea markets, and local community, health, and recreation centers. The researcher promoted the program by word-of-mouth to anyone she came in contact with in the community. In addition, the KCHC provided the researcher with a list of
referrals. Each referred participant was then contacted by the researcher about the start date of the program and referred back to the KCHC if more information was required.

**Study Recruitment.** Participants were recruited into the study on September 28th and September 30th, 2010 during the first week of the ‘Reach’ class. A group of 12 individuals were invited to participate in the study; 11 provided active informed consent and were randomly allocated to either the intervention (n=6) or comparison (n=5) group.

Mentor participants were recruited on September 30th and October 5th, 2010 at the beginning of two ‘Reach maintenance’ classes. Nine participants in the ‘Reach maintenance’ class were informed about the study and were given letters of information. Six participants provided informed consent and were matched with mentees. Matching procedures are described below in more detail.

**‘Reach’ Physical Activity Program**

The program aim of ‘Reach’ is to assist with the prevention and management of chronic health conditions and to support individuals who have difficulty completing day-to-day activities due to health concerns and disabilities (http://www.kchc.ca/active.shtml). Additionally, the aim of KCHC staff was to provide an accessible and appropriate program for individuals with chronic health conditions in the target low-income neighbourhood. The exercise program was free of charge for program participants. Participants were also offered assistance with transportation if requested, and food and beverages were provided.

Exercise sessions focus on the improvement of strength, flexibility, endurance, and balance. Activities included gentle resistance training exercises, cardiovascular activities, balance activities, and stretching exercises. Most activities were completed sitting or standing in one place, with the exception of walking. Each exercise session followed a detailed plan as part of the program objectives to progressively increase exercise intensities over 12 weeks. Classes began
with stretching, flexibility, and muscular endurance exercises, followed by walking and other aerobic activities. The program ended with stretching exercises. All participants followed the same program of exercise activities; however, training intensities and choice of activities were tailored to the physical condition, abilities, and interests of participants. Trained and experienced program facilitators employed by KCHC were responsible for program implementation. Facilitator duties included monitoring safety, ensuring proper execution of program activities and answering questions. Emphasis was always placed on participants’ personal capabilities and exercise interests and needs. The ‘Reach’ program also offered hour-long educational and/or social sessions and snacks after each exercise session including topics such as health management and diabetes education. The social/educational sessions were not provided as part of ‘Reach maintenance’ class. For each of the ‘Reach’ classes, open discussion and socializing were encouraged.

As the main researcher, I participated in both the ‘Reach’ and ‘Reach maintenance’ classes twice a week for the full study period to build rapport with the study participants and to gain a contextual understanding of the program, intervention, and participants’ physical activity beliefs and behaviours. During the exercise classes, I interacted and socialized with all the participants. I helped the exercise instructors during each class with equipment set-up and exercise demonstrations during the 12-week intervention.

**Peer Mentoring Intervention**

The peer mentoring intervention was designed to increase perceived social support and to provide information pertaining to participants’ self-efficacy with the aim of increasing physical activity and exercise program adherence on behalf of intervention participants. Below is a description of the mentor training, roles, matching, and intervention sessions.
**Mentor preparation.** Prior to the first peer mentoring session, I held a brief introductory session for the mentors to outline the purpose of the project and to explain expected roles, communication and support strategies, and to provide key information regarding the benefits and barriers of physical activity for this population. The importance of positive social support for physical activity was also briefly described. All the information overviewed in the introductory session was included in a peer mentoring resource provided to each mentor (Appendix D). The aim of the introductory session as well as the training resource was to enhance the mentors’ skills and knowledge of physical activity, motivation, social support, and mentoring as well as to confirm the commitment and expectations of each mentor. I developed the resources based on physical activity, social support, and health programming literature, and referenced all material for program participants. I encouraged participants to ask questions and to raise concerns at any time during the introductory session, or after they had time to read over the material at home. The literacy level of the training material was checked using the Flesch-Kincaid Grade Level test (Flesch, 1948) to ensure the accessibility of the document for participants, and a grade two reading level was ensured. No manipulation check was conducted based on recommendations of program staff.

**Role of mentors.** I encouraged Mentors to provide basic emotional support (talking, listening, expressing concern) and physical activity-related support (tangible assistance such as information, knowledge, time, advice and aid) to their mentees at least once a week during a 30 minute session. Examples of each type of social support (emotional, informational, material) and specific mentoring strategy examples were included in the training resource given to each mentor (e.g. Expression of concern: if your partner talks to you about their problems or difficulties with physical activity, express your concern and give helpful hints and encouragement).
Matching. Peer mentors and intervention participants were matched based on demographic variables provided at baseline, as well as perceived health and ability of participants. Research suggests that demographic and experiential similarity is a key aspect of social support interventions (Cohen et al., 2000; Shumaker & Czajkowski, 1994; Thoits, 1995; Uchino, 2004). Having common demographics and experiences can help natural friendship formation processes, the understanding of common issues and barriers, and mutual and equitable communication (Cohen et al., 2000; Harris, Brown, & Robinson, 1999; Uchino, 2004).

Peer mentoring sessions. I asked each mentor and mentee to meet at least once a week for 30 minutes and encouraged the peer partners to contact each other outside of the ‘Reach’ programs. To enable easier and consistent scheduling, the peer mentor sessions were held between the time slots of the two ‘Reach’ classes on Thursdays of each week of the program. To facilitate a natural and equitable friendship process, I gave little guidance to the peer partners. I simply asked Mentors and Mentees to meet and talk with each other about physical activity, health, and the ‘Reach’ program. I set up the peer partners in the exercise room at a distance from other pairs to facilitate the one-on-one support proposed by the conceptual framework of the study. I attended each peer mentoring sessions to observe the mentoring relation and provide support if needed. I did not participate in any mentoring discussions.

Retention and Sample Size

Eleven participants were recruited from the ‘Reach’ program and randomized into intervention (n=6) and comparison groups (n=5). Six mentors were recruited and matched with intervention participants.

Two mentors (1 male and 1 female) dropped out of the class and study at the start of the program due to their health conditions. The two intervention participants paired with the two mentors who dropped out immediately were then moved to the comparison group, which negated
the randomization of groups. However, the two intervention participants moved to the comparison group did not participate in a mentoring session. Additionally, a comparison group participant dropped out at the start of the program due to health issues. Thus, at baseline, there were 6 comparison group participants (4 female, 2 male), 4 intervention participations (3 female, 1 male), and 4 mentors (3 female, 1 male) for a total sample of 14.

At six weeks, two intervention participants dropped out of the class and out of the study. When asked, they told the researcher it was due to conflicting family commitments. Their assigned mentors were thus relieved of their mentoring duties. Thus, for the second half of the peer mentoring intervention (from 6 to 12 weeks), there remained 6 comparison group participants, 2 intervention participants, and 2 active mentors, N=10. Intervention participants and mentors were all women.

Some participants who remained in the program did not complete the 12-week questionnaire. Two comparison group participants did not attend the two days during which data were collected at 12-weeks, one due to illness and the other due to a conflicting commitment. These participants were included in data analysis at 6-weeks as they did not drop-out of the program. Two of the women who did not complete the 12-week questionnaires did complete the post-program interview; however one of the women was unavailable due to illness in the family and was thus lost to follow-up.
Figure 2. Participant retention

Recruitment
1,000 flyers
KCHC referrals

12 'Reach' participants

11 participants were randomized

Comparison (n=5)

Intervention (n=6)

1 immediate drop-out

2 moved to comparison

Baseline

n=6

6-Week

n=6

1 drop-out
2 absent

12-Week

n=3

n=2

n=2

Interview

n=3

n=2

n=2

KCHC

9 'Reach Maintenance'

Declined (n=3)

6 Mentors completed baseline

Mentors (n=6)

2 immediate drop-outs

2 relieved of mentor duties
Data Collection Overview

Case study research capitalizes on collecting data on many variables using multiple sources of data and methods. For the current study, both qualitative and quantitative data were collected and used in the final analysis, with a strong emphasis on qualitative data collected via post-intervention interviews. Four sources of information were included in the study: surveys, weekly physical activity diaries, program attendance, and post-intervention interviews. A major objective of the data collection was to record exercise program adherence as an outcome variable, as well as to collect self-reported factors that affected physical activity, perceived social support, and perceived self-efficacy via interviews and surveys. Qualitative interviews were used to gather more in-depth information about participant experiences.

Quantitative Measures

Demographic information was obtained from all participants at baseline. Perceived health status, self-reported physical activity, perceived social support, and barrier self-efficacy were assessed at baseline, 6-weeks, and 12-weeks for intervention and comparison group participants. Demographics and physical activity behaviour were assessed at each of the same time points for mentor participants (Appendix B).

Program adherence. Program adherence was measured as the percentage of total ‘Reach’ classes attended by each participant. Attendance data were collected by the researcher and ‘Reach’ program staff and self-reported by participants in activity diaries. Attendance collected by the researcher was used in data analysis. In total over the 12 weeks, 22 ‘Reach’ classes were offered; 10 in the first six weeks, 12 during the second six weeks.

Demographics. The demographic questionnaire included age, sex, race/ethnicity, education, employment status, and household composition and income. The demographic questionnaire was provided by the KCHC (Appendix B section 1).
**General health status.** Perceived general health was assessed by asking participants to indicate the following: in general, I rate my health status as (excellent, very good, good, fair, poor; Appendix B section 1).

**Physical activity.** Physical activity was assessed using an adapted version of the Modifiable Activity Questionnaire (MAQ; Kriska, Knowler, Laporte et al., 1990). The MAQ assesses previous-year and previous-week occupational and leisure activities, inactivity due to disability, and time spent watching television (Kriska, 1997). The MAQ was chosen to get a sense of the types of activities ‘Reach’ participants engaged in and to assess potential change in physical activity levels over the 12-weeks of the ‘Reach’ program. The MAQ was designed for easy modification to maximize the ability to use the questionnaire to assess physical activity in a variety of populations (Kriska, 1997). For the current study, the questionnaire was reworded to assess previous month physical activity in the current study and a list of leisure activities typical to this population was created with staff input to maximize the relevance of the questionnaire. Thus, some activities were added (such as light and heavy housework and stretching), while other activities were deleted (such as horseback riding, hunting, and water hauling; Kriska et al., 1990). Moreover, an ‘other’ option was included in the list of activities that enabled participants to account for any leisure physical activities not included in the list provided.

The MAQ is divided into three sections: (a) leisure activity, (b) inactivity, and (c) occupational activity. The leisure section of the questionnaire asks participants to identify all activities performed during the previous month, excluding activities performed during the ‘Reach’ program. Detailed information is collected about the frequency and duration of each activity as indicated by the average number of times per week during the previous month each activity was performed, and the average number of minutes spent actively participating in each activity. For each activity, participants also record the intensity as light (light change from normal
breathing), medium (above normal breathing), or heavy (heavy breathing), as well as activity location (i.e., home, outside, or in a facility). To assess physical activity from occupational activities, participants are asked to list all jobs held over the previous month, including ‘occupations’ such as homemaker, retired, or unemployed. For each job entry, participants are instructed to report time spent walking or bicycling to/from work, average job schedule (weeks/month, days/week, hours/day), the number of hours spent sitting at work, as well as to indicate from a list of categories the most common physical activities performed when not sitting at work. Finally, for inactivity, participants are asked to indicate the average number of hours per day usually spent watching television, or to indicate if they were confined to a bed or chair for more than one week over the previous month as a result of illness, injury, or surgery (Appendix B section 2).

The MAQ was interview-administered in small groups (1-3 people) by the main researcher, research assistants, and program staff who were trained by the main researcher prior to administration of the questionnaire. Some participants chose to complete the MAQ on their own. Instructions were included in the body of the document to facilitate self-administration and instructions were read with the participants prior to completion. A high level of agreement has been reported between self-administrated and interviewer-administered modes of the MAQ as shown by previous interclass correlation coefficients for leisure (0.90), occupational (0.82) and total physical activity levels (0.83), as well as television watching (0.97; Vuillemin, Oppert, & Guillemin, 2000). Scoring for the MAQ data was based on a published compendium indicated metabolic equivalent tasks (MET) were assigned to each activity (Ainsworth et al., 2000). For each participant, energy expenditure was calculated in MET-hours per week averaged over the previous month by multiplying the number of hours per week of each leisure activity by its assigned estimated metabolic cost (MET; Ainsworth et al., 2000). Consistent with previous
research (Kriska et al. 2003) and current physical activity guidelines (Canadian Society for Exercise Physiology, 2011) only those activities that demanded a MET value greater than that required by activities of daily living (i.e., >2.0 MET) and only moderate and hard occupational physical activities were included in the analysis. Based on past studies that used the MAQ tool (Kriska 1997, 2001), a separate calculation was conducted that excluded housework and walking.

Physical activity assessment using the MAQ has been validated against energy expenditure measures using the Caltrac activity monitor (average counts/hour) and the doubly-labeled water technique (Kriska, 1997). The MAQ has demonstrated to be a reliable assessment of self-reported physical activity with test-retest rank-order correlations that ranged from 0.62 to 0.96 for leisure and occupational activity (Kriska, 1997).

**Social support.** The Social Support for Exercise Survey (Sallis, Grossman, Pinski, Patterson, & Nader, 1987) was used to assess perceived exercise-related social support from family, friends, and peer mentors (in intervention group participants only). This scale was designed to measure social support specific to exercise. A ‘Peer Mentor’ subscale was included in addition to the original ‘Family’ and ‘Friends’ scale to assess social support interactions of peer mentors for intervention group participants. Participants were asked to rate the frequency of support for exercise on 12 items for each family, friends, peer mentors using a 5-point scale (1=never to 5= very often). For example, separate questions asked participants how often family members, friends, and peer mentors gave encouragement to exercise in the previous month (Appendix B section 3). The questions and scoring were not altered in any way from the original instrument (Sallis et al., 1987). Each participant received a separate social-support-for-exercise score ranging from 0-60 for family, friends, and peer mentors.

The friends and family subscales have demonstrated adequate internal consistency in Caucasian college women (α=0.91 and 0.84, respectively), as well as adequate 1-to 2-week test-
retest reliability ($r=0.79$ for both subscales). Criterion validity in the same sample was established with each of the ‘Family’ and ‘Friend’ subscales significantly positively related to a one-item self-rating physical activity question ($r=0.35$ and $0.46$, respectively; Sallis et al., 1987). These scales also have demonstrated high internal consistency and criterion validity with self-reported physical activity in women and men (Baecke Activity Scale and the Harvard Alumni Scale; Trieber et al., 1991).

**Self-efficacy.** The Barriers Efficacy Scale (McAuley and Mihalko, 1998) was used to assess changes in barrier-related exercise self-efficacy in participants. The Barriers Efficacy Scale uses a 12 item, 0-10 Likert-like scale (where 0= not confident and 10= very confident) to assess self-efficacy expectations related to the ability to continue exercising in the face of barriers. The scale was slightly modified to include ‘be regularly physically active’ as an alternative to ‘exercise 3 times per week’. For example, one item is “I believe that I can be regularly physically active, even if the weather is bad” (Appendix B section 4). Reliability of the Barriers Efficacy Scale has been reported to have a standardized alpha coefficient of .93 (Duncan & McAuley, 1993). Strength of efficacy was calculated for each participant by summing the numerical confidence ratings and dividing by the total number of items (i.e., 12) to provide a mean score for each participant (McAuley & Mihalko, 1998). Internal consistencies for this scale have been reported at .82 and .76, and test-retest reliability has been reported .82 to .96 (McAuley & Mihalko, 1998).

**Qualitative Approach and Measures**

**Sample selection.** The sample of interviewees was chosen due to the combination of many factors including time, resources, availability, and attrition (Myles & Huberman, 1994). The four participants who dropped out of the intervention (2 mentees, 2 mentors), including men, were contacted to be interviewed, but all declined due to lack of time and/or health concerns. All
retained mentors and mentees, and the majority of comparison participants were women.

Recruitment methods was thus refocused to women-only. In the last week of the ‘Reach’ physical activity programs, seven study participants were invited to participate in the interviews and all agreed. The interviews were conducted February 3rd to 18th, 2011 with the seven participants who provided active consent.

**Interview.** An interview is “a conversation that has a structure and a purpose “(Kvale & Brinkman, 2009, p.3) and is used as a research method to “enter into the other person’s perspective” (Patton, 2002, pp. 341). Interviewing as a data collection technique is common and essential in case study research (Yin, 2009; Hancock & Algozzine, 2006). Interviews provide access to personalized beliefs, meanings, behaviours, and events (Hancock & Algozzine, p. 39) that lend credibility to the interpretation of the phenomena in question (Kvale & Brinkman, 2009, p. 3). The interviews were used to explore the impact of peer mentoring, social support, and self-efficacy within the exercise program, and perceived barriers and facilitators to physical activity for all study participants.

Thematizing an interview answers the “why, what, and how of the interview” and “refers to the formulation of research questions and a theoretical clarification of the theme investigated” (Kvale & Brinkman, 2009, p.105). The design of the interview was based on themes derived from the conceptual and theoretical framework of the current case study. A semi-structured interview guide was developed to capture participant experiences of physical activity, program participation, and the peer mentoring intervention (Appendix C). The guide enabled a focused approach to collecting comprehensive data related to the themes of interest for later analysis. Questions were structured and asked in an open-ended fashion to enable participants to respond in their own words (Patton, 2002, p. 348). Notes were taken during and after the interview for each participant and included in the case study database.
All interviewees (intervention, comparison, and mentors) were asked about perceived barriers and facilitators to physical activity participation, and the influence of social support and self-efficacy within the ‘Reach’ exercise program. Mentors and intervention group participants were asked additional questions about the process and impact of peer mentoring on social support, self-efficacy, and exercise program adherence.

**Interview context.** Steps were taken by the researcher to establish a safe and relaxed environment that enabled an open discussion of experiences and feelings (Kvale & Brinkman, 2009). Interviews were conducted at a time and place mutually convenient for the participants and the researcher. The majority of interviews were conducted in local coffee shops in the north Kingston community. To minimize financial burden, assistance with transportation and food and beverage was provided. Rapport was built with participants prior to the interview during the researcher’s weekly time with participants. The time spent with participants also made it easy to listen, understand, and follow-up on information given by participants. Moreover, the interview was set up by briefing the participants about the overall subject and purposes of the interview, its framework, and the use of the tape recorder (Kvale & Brinkman, 2009).

Participants were encouraged to ask any questions about the interview process before starting the interview and were told they could also ask questions after the interview. Additionally, the researcher attempted to promote a positive conversation-style interview and encouraged participants to talk about their honest experiences and feelings. Interviewer strategies included opening with broad introductory questions proceeded by follow-up and probe questions that emphasized the active listening of the researcher (Patton, 2002). Participants were encouraged to comment and ask questions at the end of each interview. There was also a short period to debrief after each interview, at which time the researcher mentioned some keys points.
and interpretations taken from the interview and asked the participants to provide feedback on the reliability of the researcher’s interpretation.

**Physical activity journals.** In a review of diary research with older adults, Jacelon and Imperio (2005) suggest that diaries are useful for tracking day-to-day health behaviours, including exercise. In their review, they suggest that one to two weeks are the optimal length of time for diary-keeping. The physical activity diary for the current study was created by the researcher and included columns to track daily activities, time, and effort level (light, moderate, vigorous as described) of each activity, and personal reflections of activities and/or experiences as well as their ‘Reach’ program attendance. For the intervention group, two additional columns were added for contact and activities with peer mentor/mentee and reflection. Every two weeks, each participant (intervention, comparison, and mentors) was given a new 2-week journal and was asked to record and describe all the activities they engaged in over the two weeks. Participants were encouraged to ask any questions about their physical activity journals each week. The researcher collected journals every two weeks. Compliance with the diaries was very inconsistent within and between individuals, and thus was not used as a primary source of data.
Chapter 5

Data Analysis

Quantitative Analyses

All quantitative data were entered into SPSS version 19 for analyses. Descriptive statistics (median and inter-quartile range) were computed for physical activity, social support, and barrier self-efficacy at baseline, 6-weeks, and 12-weeks. A Wilcoxon Signed-Rank test was used to determine whether there were differences in measures of physical activity, social support, and barrier self-efficacy between baseline and 6-weeks in both intervention and comparison groups. A Mann-Whitney test was used to determine if there were differences between the intervention and comparison group on study variables at baseline and at 6-weeks. Descriptive statistics (means and standard deviations) were computed on the Barrier Self-Efficacy Scale items.

Qualitative Analysis

In order to accurately revisit the data after the interviews were complete, each interview was audio taped and transcribed verbatim by the main researcher. Audio recording also enabled the researcher to listen and respond more attentively during the interview, decreasing the reliance on note-taking for verbatim quotations (Patton, 2002, p. 385). Express Scribe (http://www.nch.com.au/scribe/) was used to manually transcribe and save files. NVivo 9 was used to manage data.

A start list of codes was developed to mirror the study’s theoretical framework and guiding questions (Miles & Huberman, 1994). Interview transcripts were first printed and read multiple times to ensure familiarization and a general understanding of the interviews as a whole. Content analysis was carried out on the interview data. Interview transcripts were first manually
coded by labeling raw data using the code start list. Additional codes were added to the list as warranted. Multiple codes were added to longer passages in which various themes emerged (Miles & Huberman, 1994). Revisions to start list and manual codes were made to reflect the data accurately. Ill-fitting codes were discarded, and similar codes were combined. Codes were then separated, sorted, and refined into more focused codes to enable the identification of broader themes (Miles & Huberman, 1994). Nvivo 9.0 was used to add memos and annotations to track the researcher’s thoughts and analysis.

Establish Trustworthiness and Rigor of Interview Data

Trustworthiness of the qualitative interview data for the current study was established in the following ways during data collection and analysis:

**Dependability.** Qualitative researchers are concerned with answering the question ‘are the results consistent with the data’ or, ‘are the results dependable?’ (Merriam, 2009, p. 221). This compares to the question of reliability: ‘can truth be established by replication?’ The emphasis for qualitative interviewing is to take appropriate actions to ensure the findings are consistent with, and depend on contextual data that were collected. Dependability is related to both the process and product of interview data collection. The strategies below were employed to ensure outside researchers can understand and check how the researcher arrived at study results:

- External researchers and project supervisors were consulted for the development of the interview guide to ensure the inclusion of open-ended questions;
- Each interview was audio taped and transcribed verbatim;
- Long extracts of data were reported, often including the interview questions that prompted answers;
- Processes of data collection and analysis were detailed, and an audit trail detailing interaction with interview data was kept and stored.
**Credibility.** Internal validity deals with the extent to which results are true. In qualitative studies, internal validity is assessed in relation to the specific topic, answering the question ‘did the method investigate what it intended to investigate, given intended phenomenon and variables of interest?’ (Kvale & Brinkman, p. 238). Participants’ physical activity beliefs and behaviours with an emphasis on social support, barriers and self-efficacy were explored using qualitative interviews. One strategy that the researcher employed was spending a good deal of time with the participants in their context, where the researcher gained an understanding of participants’ meanings and interpretations. Moreover, the researcher sought variation in the understandings of physical activity and key themes, as well as alternative explanations of the phenomenon of interest. Other strategies to increase the credibility of interview data included triangulation of data sources and interviews:

**Triangulation of Data Sources.** Three methods of data collection were employed: interviews, attendance records, and informal observations/field notes. Interview information was checked against each of these data sources relative to the phenomenon and conceptualization of physical activity, social support, barriers, and self-efficacy.

**Triangulation of Researchers.** All interviews were audio taped and transcribed verbatim, enabling sufficient time to review and check data collected during each interview. A research supervisor cross checked the transcribed interviews with findings and analysis. Only the study researchers had access to data due to the ethics agreement.

**Triangulation of Interviews.** Respondent validation is concerned with soliciting feedback on interview data and analysis from the people who were interviewed. Key themes that emerged from each interview were reviewed immediately post-interview with each interview participant to check the researcher’s interpretations and meanings. Participants had the opportunity to provide additional thoughts and understandings, as well as to clarify any misunderstandings on behalf of
the researcher. Transcribed interviews were not returned to interview participants for review due to time and resource constraints.

**Transferability.** External validity is concerned with the generalizability of findings, or the extent to which the findings can be applied to the population as a whole. The external validity of qualitative studies is often questioned; however, as with internal and external validity, the questions must be reconceptualized to fit qualitative research. Generalizability is replaced by the concept of transferability, meaning the extent to which enough contextual description is provided to enable outside researchers and practitioners to judge for themselves whether they can transfer the findings to another context (Merriam, 2009). The purpose of the current case study was not to provide generalized results, but to study the specific case to illustrate the specific phenomenon in question: physical activity behaviour and exercise program adherence for adults with chronic health conditions in a low-income neighbourhood. Thus, a key advantage of the current case study is to give insight into contextualized experience and meaning and the implication it can have for the purposely sampled exercise program and participants in question. Moreover, the participants and setting are described in detail to enable readers to assess for themselves the similarities among study participants and results to other contexts (Miles & Huberman, 1994). Additionally, the current study worked within a well-defined theoretical framework, which is relevant for other contexts and populations and can be applied elsewhere.
Chapter 6

Findings

Quantitative

Participant Characteristics

Intervention and comparison participants did not differ on demographic variables or perceived health status at baseline (Table 1). The population was middle-aged to older adults (range 49-81 years, $M=67$ years, $SD=10.47$). At baseline, there were seven women (70%) and three men (30%). The majority of participants had below a college education (60%). Seventy percent of participants rated their health as either ‘fair’ or ‘good’. Mentor participants were similar to intervention and comparison participants on demographic variables. At baseline, there were three women mentors and one mentor that was a man. Mentors were middle-aged to older adults ($M=63.33$ years, $SD=4.5$), and all mentors had below a college education.

All of the participants in the study discussed their individual health conditions with the researcher during qualitative interviews. All participants had co-morbidities including Spina Bifida, arthritis, osteoporosis, osteoarthritis, and fibromyalgia. Many of the participants were recovering from surgeries, and a few participants were in remission from cancer.

Descriptive Statistics

Median and inter-quartile range (IQR) scores for physical activity, social support, barrier self-efficacy, and exercise program adherence for baseline, 6-weeks, and 12-weeks are presented for intervention and comparison group participants in Table 2. Median activity scores at each time point indicated that participants were on average meeting minimum physical activity requirements (450 to 885 MET*min*week) when walking was included in the analysis, but were not meeting requirements when walking was excluded. This is based on the MET range of 3 to 6
for moderate-intensity activity and the recommended 150 minutes per week (3 x 150= 450 to 5.9 x 150= 885). The range of inter-quartile MET scores is quite large.

Baseline and 6-week data analysis included six comparison (2 men, 4 women) and four intervention participants (4 women), for a total sample of 10 participants for baseline and 6-week data. At 12-weeks, data were collected from only 5 participants (three comparison and two intervention) because of drop-outs and absenteeism on data collection days. Exercise program adherence for participants at 6-weeks was moderate to high. Intervention participants adhered on average to 87.5% of the exercise classes at six weeks, and comparison participants adhered to an average of 68.3% of exercise classes at 6-weeks (median scores 90.0% and 70.0%, respectively). Program adherence decreased in both groups at 12-weeks. Of the 10 participants ($M = 67$ years) and 4 mentors ($M=63$ years) at baseline ($n=14$), 5 participants and 4 mentors ($n=9$) completed the program at 12-weeks (64.2%; see Figure 2, pg. 47).

Intervention participants perceived higher social support from family than friends at each time point, with an increased median score from baseline to 6-week for both types of social support. Perceived mentor support also increased from 6-weeks ($Mdn= 23.5, IQR= 16.0-34.0$) to 12-weeks ($Mdn= 31.5, IQR= 21.0-31.5$). Comparison participants perceived more support from friends, with slight increases from baseline to 6-weeks. Median barrier self-efficacy scores decreased in intervention participants from baseline to 6-week and were similar at each time point for comparison participants.

Mean ratings for each item of the Barriers Efficacy Scale are presented in Table 3. The stronger the barrier self-efficacy score, the more confident participants were in their ability to overcome the specific barrier to physical activity, thus low scores indicate barriers that are perceived to be difficult to overcome. The five lowest ratings for barrier self-efficacy at baseline were feeling ill, don’t like activity/program, other demands, weather, and stress, indicating these
were the strongest barriers at baseline. At 6-weeks the lowest ratings for barrier self-efficacy were feeling ill, pain/discomfort, don’t like activity/program, difficult to get to location, and weather, indicating these to be the strongest barriers at 6-weeks.

**Mann-Whitney Between Group Comparisons**

Mann-Whitney Between Group Comparisons revealed there were no significant differences between groups for physical activity measures, social support from family and friends, or barrier self-efficacy at baseline ($p>.05$, 2-tailed), suggesting that the intervention groups were similar on these variables at baseline (Table 4). At 6-weeks (Table 5), intervention participants adhered to the exercise program significantly more than comparison participants ($Mdn=90\%$ compared to $Mdn=70\%$; $U=3.0$, $Z=-2.01$, $p<.05$, $r=-0.64$). Moreover, the intervention group also reported significantly higher family support ($Mdn=43$) than comparison participants ($Mdn=18$) at 6-weeks ($U=3.00$, $Z=-1.92$, $p<.05$, $r=-.60$). Friend support, barrier self-efficacy, and physical activity variables between groups did not differ significantly at 6-weeks.

**Wilcoxon Signed-Rank within Group Comparison**

The Wilcoxon Signed-Rank within Group Comparisons showed there were no significant differences in study variables between baseline and 6-weeks for either intervention or comparison participants (Table 6 and Table 7, respectively). Based on the Wilcoxon Signed-Rank Test, physical activity, social support, and barrier self-efficacy did not significantly change from baseline to 6-weeks in either the intervention or comparison participants ($p>.05$). Change in perceived mentor support and adherence were not included in the analysis due to the inability to measure these variables at baseline, and small sample size at 12-weeks (no baseline to 12-week analysis).
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<td>(0)</td>
<td>1</td>
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<tr>
<td>do not wish to answer</td>
<td>3</td>
<td>(75)</td>
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<td>(0)</td>
<td>0</td>
</tr>
<tr>
<td>very good</td>
<td>1</td>
<td>(25)</td>
<td>1</td>
</tr>
<tr>
<td>good</td>
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<td>(25)</td>
<td>3</td>
</tr>
<tr>
<td>poor</td>
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<td>(0)</td>
<td>1</td>
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Table 2. Median and inter-quartile range scores for physical activity (PA), social support, barrier self-efficacy (BSE), and exercise program adherence at baseline, 6-week, and 12-week for intervention and comparison participants

<table>
<thead>
<tr>
<th></th>
<th>Intervention</th>
<th></th>
<th></th>
<th>Comparison</th>
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<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Baseline</td>
<td>6-Week</td>
<td>12-Week</td>
<td>Baseline</td>
<td>6-Week</td>
<td>12-Week</td>
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<tr>
<td></td>
<td>n=4</td>
<td>n=4</td>
<td>n=2</td>
<td>n=6</td>
<td>n=6</td>
<td>n=3</td>
</tr>
<tr>
<td>PA inc. walking†</td>
<td>1275 (225-2100)</td>
<td>1290 (656-1764)</td>
<td>1025 (675-1025)</td>
<td>1356 (511-2110)</td>
<td>768 (313-1481)</td>
<td>843 (323-843)</td>
</tr>
<tr>
<td>PA exc. walking‡</td>
<td>50.1 (0-362)</td>
<td>384 (72.0-480)</td>
<td>62.1 (0-62.1)</td>
<td>423 (88.6-1425)</td>
<td>323 (112-770)</td>
<td>225 (0-225)</td>
</tr>
<tr>
<td>Family Support</td>
<td>25.0 (21.2-46.7)</td>
<td>43.0 (22.2-60.0)</td>
<td>19.5 (16.0-19.5)</td>
<td>15.0 (12.0-23.0)</td>
<td>18.0 (14.2-25.5)</td>
<td>12.0 (12.0-12.0)</td>
</tr>
<tr>
<td>Friend Support</td>
<td>15.0 (12.0-22.5)</td>
<td>27.5 (15.7-28.7)</td>
<td>17.5 (12.0-17.5)</td>
<td>17.0 (12.0-33.7)</td>
<td>25.0 (19.5-32.0)</td>
<td>32.0 (12.0-32.0)</td>
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<tr>
<td>Mentor Support</td>
<td></td>
<td></td>
<td></td>
<td>23.5 (16.0-34.0)</td>
<td>31.5 (21.0-31.5)</td>
<td></td>
</tr>
<tr>
<td>BSE (%)</td>
<td>87.9 (53.7-93.9)</td>
<td>60.4 (43.3-77.5)</td>
<td>55.0 (45.8-55.0)</td>
<td>65.4 (47.0-93.5)</td>
<td>72.9 (54.5-84.1)</td>
<td>81.6 (80.0-81.6)</td>
</tr>
<tr>
<td>Adherence (%)</td>
<td>90.0 (82.5-90.0)</td>
<td>71.0 (67.0-71.0)</td>
<td></td>
<td>70.0 (60.0-82.5)</td>
<td>54.5 (37.7-85.2)</td>
<td></td>
</tr>
</tbody>
</table>

Note: Data presented as median (inter-quartile range). †Average MET*min*Wk over past month including self-reported walking; ‡Average MET*min*Wk excluding self-reported walking.
Table 3. Descriptive statistics for the Barriers Efficacy Scale for intervention and comparison participants combined at baseline (N=10) and 6-weeks (N=10)

<table>
<thead>
<tr>
<th>Time</th>
<th>Scale Item</th>
<th>M</th>
<th>SD</th>
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<tbody>
<tr>
<td>Baseline</td>
<td>Weather</td>
<td>68.0</td>
<td>3.36</td>
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<tr>
<td></td>
<td>Other demands</td>
<td>65.0</td>
<td>31.7</td>
</tr>
<tr>
<td></td>
<td>Bad mood/depressed</td>
<td>78.0</td>
<td>26.1</td>
</tr>
<tr>
<td></td>
<td>Pain/discomfort</td>
<td>75.0</td>
<td>24.6</td>
</tr>
<tr>
<td></td>
<td>Exercise alone</td>
<td>74.0</td>
<td>26.3</td>
</tr>
<tr>
<td></td>
<td>Not enjoyable/fun</td>
<td>73.0</td>
<td>23.1</td>
</tr>
<tr>
<td></td>
<td>Difficult to get to location</td>
<td>73.0</td>
<td>34.6</td>
</tr>
<tr>
<td></td>
<td>Don’t like activity/program</td>
<td>63.0</td>
<td>33.0</td>
</tr>
<tr>
<td></td>
<td>Feeling Ill</td>
<td>60.0</td>
<td>28.6</td>
</tr>
<tr>
<td></td>
<td>Feeling self-conscious</td>
<td>84.0</td>
<td>21.9</td>
</tr>
<tr>
<td></td>
<td>No encouragement</td>
<td>82.0</td>
<td>23.9</td>
</tr>
<tr>
<td></td>
<td>Stress</td>
<td>70.0</td>
<td>33.9</td>
</tr>
<tr>
<td>6-Week</td>
<td>Weather</td>
<td>63.0</td>
<td>33.3</td>
</tr>
<tr>
<td></td>
<td>Other demands</td>
<td>70.0</td>
<td>24.0</td>
</tr>
<tr>
<td></td>
<td>Bad mood/depressed</td>
<td>76.0</td>
<td>27.9</td>
</tr>
<tr>
<td></td>
<td>Pain/discomfort</td>
<td>56.0</td>
<td>26.3</td>
</tr>
<tr>
<td></td>
<td>Exercise alone</td>
<td>71.0</td>
<td>26.4</td>
</tr>
<tr>
<td></td>
<td>Not enjoyable/fun</td>
<td>65.0</td>
<td>20.1</td>
</tr>
<tr>
<td></td>
<td>Difficult to get to location</td>
<td>59.0</td>
<td>33.1</td>
</tr>
<tr>
<td></td>
<td>Don’t like activity/program</td>
<td>56.0</td>
<td>35.6</td>
</tr>
<tr>
<td></td>
<td>Feeling Ill</td>
<td>46.0</td>
<td>27.5</td>
</tr>
<tr>
<td></td>
<td>Feeling self-conscious</td>
<td>66.0</td>
<td>21.7</td>
</tr>
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<td></td>
<td>No encouragement</td>
<td>74.0</td>
<td>27.9</td>
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<tr>
<td></td>
<td>Stress</td>
<td>83.0</td>
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</table>

*Note: Data presented as %*
Table 4. Mann-Whitney test for comparison between intervention and comparison groups on study measures at baseline (N=10)

<table>
<thead>
<tr>
<th>Group</th>
<th>Median</th>
<th>$U$</th>
<th>$z$</th>
<th>$p$</th>
<th>$r$</th>
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</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comparison</td>
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<td>11.00</td>
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<td>.914</td>
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<tr>
<td>Intervention</td>
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<td></td>
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<tr>
<td>PA walk$^1$</td>
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</tr>
<tr>
<td>Comparison</td>
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<td>-.32</td>
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<td>Intervention</td>
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<td>PA no walk$^2$</td>
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<td>Comparison</td>
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<tr>
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<tr>
<td>Family Support</td>
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<td></td>
</tr>
<tr>
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<td>Intervention</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Friend Support</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Comparison</td>
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<td>9.00</td>
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<td>.610</td>
<td>-.20</td>
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<tr>
<td>Intervention</td>
<td>15.0</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>BSE (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comparison</td>
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<tr>
<td>Intervention</td>
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</table>

*p<0.05, 2-tailed

Note: $^1$Average MET*min*Wk over past month including self-reported walking; $^2$Average MET*min*Wk not including self-reported walking
<table>
<thead>
<tr>
<th>Group</th>
<th>Median</th>
<th>U</th>
<th>z</th>
<th>p</th>
<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td>PA walk</td>
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<td></td>
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</tr>
<tr>
<td>Comparison</td>
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<td>PA no walk</td>
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<td>Family Support</td>
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<td>Comparison</td>
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<tr>
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<td></td>
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<tr>
<td>Friend Support</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Comparison</td>
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<td>11.50</td>
<td>-0.107</td>
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<td>Intervention</td>
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<tr>
<td>BSE (%)</td>
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<tr>
<td>Comparison</td>
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<td>-0.853</td>
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<tr>
<td>Intervention</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Adherence (%)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Comparison</td>
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*p<0.05, 1-tailed
Note: 1 Average MET*min*Wk over past month including self-reported walking; 2 Average MET*min*Wk not including self-reported walking
Table 6. Wilcoxon Signed-Rank test for comparison of difference between baseline and 6-weeks measures in intervention group participants (N=4)

<table>
<thead>
<tr>
<th></th>
<th>Mean Difference</th>
<th>Z</th>
<th>p</th>
<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td>PA walk¹</td>
<td>+36.6</td>
<td>0.00</td>
<td>.563</td>
<td>0</td>
</tr>
<tr>
<td>PA no walk²</td>
<td>+174.75</td>
<td>-1.10</td>
<td>.188</td>
<td>-.38</td>
</tr>
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<td>Family SS</td>
<td>+10.75</td>
<td>-1.60</td>
<td>.125</td>
<td>-.56</td>
</tr>
<tr>
<td>Friend SS</td>
<td>+7.5</td>
<td>-1.60</td>
<td>.125</td>
<td>-.56</td>
</tr>
<tr>
<td>BSE</td>
<td>-18.1</td>
<td>-1.60</td>
<td>.125</td>
<td>-.56</td>
</tr>
</tbody>
</table>

*p<0.05, 1-tailed

*Note:* ¹Average MET*min*Wk over past month including self-reported walking; ²Average MET*min*Wk not including self-reported walking.

Table 7. Wilcoxon Signed-Rank test for comparison of difference between baseline and 6-week measures in comparison group participants (N=6)

<table>
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<tr>
<th></th>
<th>Mean Difference</th>
<th>Z</th>
<th>p</th>
<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td>PA walk¹</td>
<td>-444.9</td>
<td>-1.57</td>
<td>.156</td>
<td>-.45</td>
</tr>
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<td>PA no walk²</td>
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<td>-0.94</td>
<td>.438</td>
<td>-.27</td>
</tr>
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<td>Family SS</td>
<td>+2.17</td>
<td>-1.79</td>
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<tr>
<td>Friend SS</td>
<td>+3.83</td>
<td>-0.677</td>
<td>.563</td>
<td>-.19</td>
</tr>
<tr>
<td>BSE</td>
<td>+0.10</td>
<td>0.00</td>
<td>1.00</td>
<td>0</td>
</tr>
</tbody>
</table>

*p<0.05, 2-tailed

*Note:* ¹Average MET*min*Wk over past month including self-reported walking; ²Average MET*min*Wk not including self-reported walking.
Qualitative Findings

The following section provides the qualitative findings for each research question. The first section relates to peer mentoring as an intervention strategy. The second section includes the influence of social support and self-efficacy within the exercise setting for intervention, comparison, and mentor participants. The third section addresses the barriers and facilitators to physical activity participation for intervention, comparison and mentor participants.

Peer Mentoring Intervention

Social Support

The women who participated in the peer mentoring intervention perceived increased emotional, informational, and belonging support. Supportive resources that were provided were general in nature, as well as related to physical activity. Below are the findings for the subthemes that emerged under social support for the peer mentoring intervention. The influence of supportive resources specific to self-efficacy beliefs are discussed in the following section.

Reciprocal Relationship. All of the women discussed the reciprocal nature of the peer mentoring relationship, insofar that each partner in the relationship fulfilled the mentoring role. The provision and benefits of social support were perceived as a mutual exchange, that is, mentees felt they provided support to their mentors, as well as received similar support in return:

I tried to motivate [my mentor] as much as I possibly could….when I was with her on a one-on-one basis you could tell that she was taking it all in. But here again, she was doing it for me too.

Informational Support. The peer mentoring intervention provided a unique information sharing opportunity for the women that was not provided during the ‘Reach’ classes alone. This was due to the intimate one-on-one relationship between participants during the mentoring intervention. Some of the common topics of conversation reported by the women were health,
medication, therapy, pain, weather, physical activity, and general discussions about activities of daily living such as family, cooking, and crafts.

Informational support included the provision of pragmatic advice, and guidance. The women shared information based on their experience living with chronic health conditions and participating in physical activity, exercise, and activities of daily living:

I tried to keep her motivated to try to keep the attitude up.... You know, um, like we talked about going for therapy'...But, you know I said 'once you start walking again you gonna have to really have to listen to what the therapist is going to tell you and do exactly what they ask you to do and you'll manage, you'll come through.'

How would she respond to that kind of advice?
Well, she said 'ya' she said 'I know you're right....And this is another thing I stimulated to her- 'to take your pain medicine at least a half hour before you go for therapy, because once you get into therapy the medicine is going to be working and you're going to be able to do your therapy.'

**Emotional Support.** The women revealed the importance of having someone available who listened and expressed concern, understanding, and empathy. “Having someone to talk to about stuff” was the most common and highlighted benefit of the peer mentoring experience for all the women involved and acted as an incentive to participate in the intervention, and thus adhere to the ‘Reach’ exercise program on intervention days. This was a type of support the women expressed they often lacked outside of the peer mentoring intervention (e.g. “[husbands] don’t listen anyway...my husband is-I’m better to talk to my dog. Ya it was good to have [my mentor] for that”). Having someone who is empathetic was highlighted by the women as an important component of the opportunity to talk to someone who could relate. In this way, the peer mentoring intervention was an opportunity for social validation:

I had someone to talk to that knew what I was talking about, about the pain, how the grouped helped me- how it has helped her, and that, people should get-more people should get into this

How do you think that that helped you? Being able to talk and share
It made me realize that somebody understands what I am talking about. That I understand them what they're talking about. It's something worth going into.

The common theme of having someone “that understands what I am going through” was facilitated by the women’s perceived similarity with each other (e.g. the women were “around the same age” “dealing with health things”, “got pain” and “living in the same area”):

I thought that was excellent because we had something in common. We were both handicapped at the time. So it just gives you somebody else to talk to.

Because of her doctor's appointments, because my doctor's appointments, and because of our medication and because, um, of the exercises and that we had something in common. And having all these subjects in common then we had something to talk about. It was good for us

**Belonging Support.** The peer mentoring intervention also increased perceived companionship. The women referred to their partner as their friend. Emotional support provided verbally during mentoring sessions was closely tied to the perception of belonging. In addition, one of the mentees encouraged her mentor to participate in her ‘Reach’ class with her.

Participating in exercise together, coupled with supporting each other one-on-one during the mentor sessions increased both of the participants’ perception of belonging support:

It's been a good experience for all the things that came from it that I didn't expect
*What do you think came from it?*
A friendship I hope. What comes from it? Just having fun, that we were exercising together, something in common, next time we see each other
*You said you exercise together? When was that?*
It was in their group- you were there. She kinda pulled me aside and got me to stay and exercise with that group, which was kinda nice- you feel like part of the bunch again.
The opportunity to “really get to know someone” was perceived as an additional benefit to the ‘Reach’ class (e.g. “I wouldn’t have had any reason to talk to her at all, we probably never would have talked together”). The women universally expressed that the companionship facilitated by the peer mentoring intervention acted as an incentive to continue participation in the ‘Reach’ program:

I think for someone like me who isn't too motivated- to just be able to go down and know somebody is willing to be with you and walk with you and talk to you is a good thing. Yeah.

*How do you think that influences your participation in the program?*

Well just, I think, just to take that time out to show the other person that you are willing to wait for them, uh, try to make that connection with them.

**Adherence**

Quantitative between-group analysis indicated that intervention participants showed greater adherence to the ‘Reach’ exercise class than comparison participants who were not paired with a peer mentor. Qualitative findings suggest that the peer mentoring intervention was an incentive to adhere to the exercise class and also facilitated a sense of obligation between the peer partners. The women expressed that the opportunity to provide and receive informational and emotional support during the peer mentoring intervention was an additional benefit to the ‘Reach’ class, and acted as motivation to adhere:

*So do you believe that peer support, or the mentoring, is a useful way to improve participants’ motivation to come to the program?*

Definitely.

*Definitely?*

Yes. Definitely...Just a different, a different aspect of the whole thing, right, usually come to exercise and talk to people but you don't really get to know them, but I guess the peer mentoring, the peer support thing you got to know somebody and and it was good that way. It was good motivation.
All of the women expressed the feeling of obligation and responsibility to their partner, which made them ‘feel bad’ if they did not show up on intervention days. This sense of responsibility to the other person facilitated adherence among intervention participants:

When [my mentor] was there waiting she took that half hour to wait for me, that's the least I could do out of respect for her. So, I think, now that I think back, she probably was motivation, I say half of the reason I went back. Like I said, out of respect for doing that for me, you know?

**Mentoring and Self-Efficacy Beliefs**

**Vicarious Experience.** Informational resources provided the opportunity for social comparison between the women:

With her leg and my leg we used to compare like the pain in it, and the feeling of it, and the walking, and the exercises and, um, um, living with a handicap in an everyday basis. You know, um, the pitfalls when we used to go out, you know, it'd be - you had to take a taxi or she had to take the access bus whereas I could take my car. I had a better advantage over her that way, unfortunately, but I do.

Verbal vicarious information influenced the participants' self-efficacy beliefs. The recognition of others’ barriers often influenced the women’s beliefs about their own health, and abilities. This type of vicarious information often acted as a motivator to increase physical activity behaviour:

*Do you think that [talking about health] influenced you at all?*  
I guess there were parts that I appreciated, you know, she had a lot of barriers to overcome, things that were happening to her that were making it very difficult to exercise, and to get out and be there [at the ‘Reach’ exercise program]. So I guess it made me appreciate that my stuff is minor. I can still do a lot of things, right. So that part was good, right, cause it makes you realize and want to do more, right, cause you think if you [had her disability] that would be really rough…  
*You mentioned that 'well she has these barriers and she's kinda doing it, and mine are minor' can you elaborate on that?*
You want to do more, that's for sure, and you kinda think 'I want my pity party to be over' right, and start doing a lot more things than I am

In addition, the women discussed how vicarious information influenced their beliefs about their personal capabilities to do the exercises during the ‘Reach’ exercise program (e.g. “that helps me think I can”, “if she can do this, I can do this”, and “if she can do that- I can do what I can do”). In addition to verbal vicarious information, there were times when the intervention participants were able to observe their peer partner in the separate ‘Reach’ class. This provided the opportunity for observational vicarious information which was perceived to influence self-efficacy beliefs:

Are there any other ways that seeing her do [physical activity] influenced your beliefs about your ability?
I see what she can do and I say ‘well if she can do that- I can do what I can do’ and keep motivated. Maybe not everything that she can do, but I’ll do what I can do.

Social Persuasion. This source of self-efficacy is closely tied to informational (advice, feedback, and guidance) and emotional (caring and encouragement) types of support. These types of support were related to self-efficacy by the women in the peer mentoring intervention in a few instances during the interviews. The mentors had the opportunity to discuss the maintenance ‘Reach’ class with their mentees and provide feedback about its level of difficulty. This type of informational support provided by the mentors influenced the mentee’s beliefs about their abilities to continue and proceed to the next ‘Reach’ program:

I asked [my mentor] what kind of exercises that they did in her group. Yeah, and she told me, yeah. And they weren't hard, they were something that I would be able to manage and I would be able to do it at home also. Yeah. So.

And is there anything else your mentor could have done to help you be more physically active?
No. No. No because we used to talk about the exercises, we used to talk about the exercises she could do, the exercises I could do, the exercises that was in the next level because I wanted to know if the exercise were more stressful. Um, or if they were just like mediocre, that I would be able to accomplish. And things like that, so, um, in the long run it worked out.

The mentors would often stay during the mentees’ ‘Reach’ class to help prepare snacks and socialize with other women. By staying, the mentors had to opportunity to watch their mentees exercise. The mentors provided individual feedback to their mentees based on their observations of them. This type of feedback had a direct impact on self-efficacy beliefs:

*How was she doing it [motivating you]?*
Well she was saying that she used to watch me when I first came in and… And she said that, like, many times she would tell me 'I can see an improvement in you'. You know, so, that was good feedback for me.

*What do you think that kind of feedback kind of gave you?*
To keep going. Yeah. You know, I can do it.

Feedback also influenced physical activity beliefs by reinforcing accomplishments, and was a source of encouragement for the women (emotional support):

*Do you believe [your mentor] influenced you in any way?*
Um, ya for encouragement, um, yeah, cause she, like, I was surprised when you told me, um, that she thought that I had improved since I gone in [the ‘Reach’] course...

*So her saying 'I've seen improvement' influenced you because?*
Because it was coming from [my mentor]. For one thing. And to me, I didn't feel that I was improving, I just felt I was doing the exercises to the best of my ability and that was it, you know, but to her, yeah, when it came, when the remark came from her it was encouraging. Now I was, I was really surprised when she said that to me. Yeah. So maybe she was saying that to me to give me more encouragement. You know?

**Physiological states.** The women also reported that informational support assisted with the interpretation of their physiological states, most notably pain and the ability to monitor pain and fatigue. In addition, the women universally expressed how having someone to talk to acted as
a distraction and thus minimized thinking about pain (e.g. “keep my mind occupied” and “off the pain”):

*Is there anything else that is important about the talking?*
Well, I find it helps me not think of [the pain] if I talk a little bit about it… and I see that she monitors, or you watch what you do, and how you do it. That helps me do the same.

*Do you think that that influenced your beliefs about being physically active?*
Ya, it’s that I keep my mind off the pain, so that I know that its there- but I can forget it... But we also talked about other things and she told me about how she monitors how she goes, she has to do certain things- you have to monitor how much you do, when you do it, and you set a time for getting out that you know how much time you got. And that’s what I liked about talking with someone that’s got pain, just like me... that knows what I am talking about...

*Does that kind of advice or that talking, did that actually affect your physical activity?*...
That I just say ‘k, well there is someone worse that can monitor- I can do the same.’ So I knew that she was in a different pain than I was, but if she can do it, I can do it.

*Can you explain that a bit more ‘so if she can do it, I can do it’?*
Well, that if she can keep going with her [disability] that she’s always had that, that she keeps going-that I can say ‘well an inspiration’

**Barriers to Mentoring and Participant Suggestions**

**Relationship development.** The friendship between the participants took time to develop. One pair of participants in particular discussed how connecting with each other “was difficult in the beginning” and how at first their relationship “was very uncomfortable”. Although this was a barrier to the peer mentoring process in the beginning of the intervention, both of the women who reported this challenge also discussed the change in their relationship over time:

we became pretty close I guess because when they were having their group she was the one that invited me in and was kinda hanging on to me to stay and stuff and I thought that was kinda fun- from not knowing her at all, not being comfortable with it, to laughing and having fun with her. It was great.
Being in separate ‘Reach’ classes was perceived as a strong barrier to the development and effectiveness of the peer mentoring relationship for this particular group of partners. The mentee in particular expressed that she would benefit more by participating in the same exercise class as her mentor. The mentee believed if she had participated in the same class as her mentor, she would have gotten to know her better and be able to talk about exercise. This perceived barrier, however, was not expressed by the other peer mentoring pair.

I think if we had been on a one-to-one basis right from the beginning and not had that split time, like her coming from one class- I think that was the big thing for me- if I had been in the same class with her we could have said 'oh did you like that exercise?' or 'wasn't [participant] funny today' or you know, uh, something like that, you know, 'that ball was hard to throw!' or 'I didn't feel like coming today but I did' you know? Just little things like that.

‘Reach’ Exercise Program

Qualitative findings for the factors that influence physical activity for the study population of adults with chronic health conditions participating in a community-based exercise program are organized under three major themes: outcome expectations, social support, and support on self-efficacy beliefs. The following themes include the perceptions of intervention, comparison, and mentor participants as they shared similar experiences of social support and self-efficacy within the ‘Reach’ exercise setting.

Outcome Expectations

Outcome expectations emerged from the qualitative interviews as important motivators to initiate and continue participation in the ‘Reach’ program. The women were knowledgeable of the general benefits of physical activity, and expected physical improvements as a result of initiating the ‘Reach’ exercise program (e.g. muscle and bone strength, joint function, flexibility, pain management, and weight loss). The women also expected the exercise program to assist with their future physical function:
Well I think that walking is one of the best exercises you can do. I think. And, um, I think [losing that ability] made me realize that ‘hey you need to get out there and do something or five years from now you aren’t gonna be able to do anything’.

In addition, the women highlighted expected psycho-social outcomes of group-based exercise participation (e.g. improving mental health, increasing social engagement):

We both felt that because winter time was coming, neither one of us wanted to be stuck in the apartment building, and hear the same complaints day in and day out. So that’s why we signed up- to get ourselves motivated, to get ourselves out and so we could get limbered up and so we wouldn’t go into a depression and stuff like that.

Social Support

The women were motivated to continue their participation in the ‘Reach’ exercise program because of the social opportunities and support provided during the exercise class. Increased social engagement was a very important benefit of exercise program participation. The class provided the opportunity to “get out of the house”, “be around other people”, and have “people know that you exist”. Increased social engagement was closely tied to the sense of belonging:

you just get to know everybody, it's a smaller group and you just have fun with everyone, we become, you know, it's like a family in a way, we have fun with each other.

The women expressed emotional support for one another in the form of caring and concern. The increased sense of emotional support motivated the women:

It’s just a fun, we have a lot of fun together. To me when somebody is missing you know that people are asking about you, so that's really a nice thing, right, and you do care about people when they are not there, so you are thinking about people, where if I joined the Y, if I quit the next day, nobody would, I don't think anybody would really care. So there is like a community, community motivation to, you know, keeping everybody, keeping each other going.
The women also felt that emotional support was provided by the exercise instructors. The women expressed how they felt the instructor cared for their well-being:

Like, you're just another number [at other program]... Here it was more caring for people for who they are and how they are feeling about themselves and how they are improving their lives ... I think that makes a difference...and the personality of the instructor really makes a difference. You know, she wasn't just there to collect a pay check, she was there to get us moving...so I really appreciated that and that was one of the reasons why I kept going, you know?

Having a specific program for adults with chronic health conditions located within the community facilitated the sense of belonging and acceptance:

Everyone was on equal grounds and it didn’t matter if you had full mobility, or part mobility or if you spoke English or if you read or whatever, it didn’t matter...you were just there and there was no question...you’re just there and you felt that you belonged.

The expression of emotional support coupled with the sense of belonging influenced the women’s affective states. There were various mental health benefits the women associated with their increased social participation and support during the program (e.g “gets me out of the rut”, “mentally it’s a great outlet”, “helped with my emotional things”, “keeps me from going insane”). The affective states of emotional well-being, comfort, and most notably fun, were directly associated with increased social engagement and support and had a strong influence on their willingness to continue participation:

Some days, like anybody, you think ‘ugh I don’t want to do this today’ but then you think about seeing people, and you know, I mean laughing, and seeing what’s going on, and that motivates you to go.

**Self- Efficacy Beliefs in the Exercise Setting**

**Vicarious Information.** During the ‘Reach’ class vicarious information was influential to self-efficacy beliefs and physical activity behaviour. In contrast to the peer mentoring session
that provided verbal vicarious information via information sharing, the ‘Reach’ program provided more credible observational learning opportunities. The women discussed how they watched and compared themselves to other participants based on their health status, conditions, abilities and “barriers and problems”. They explain how this, in turn, influenced their self-efficacy beliefs (e.g. “if they can do it, I can do it too”):

I just look at other people and I think 'they all have health issues and if they can do this, I can do this.' and that was most of what stuck in my head was 'if they can do it, I can do it' only maybe in a different way, you know?

Again it comes back to [participant]- well quite a few of us that have some serious health issues, not minor ones, but serious ones, and I thought 'If they can do this, I can do this'

Seeing others with health conditions successfully exercise positively influenced the women’s perceptions of their own health status and capability. This vicarious information was linked to the motivation to work hard, in relation to the theme ‘if she can do it, I can do it’:

..It makes you accept it better because you hear other peoples’ health problems…So then it makes you kind think ‘well I guess I’m not so bad off at 80 years old’…

So do you think that that influences you in any way?
I think it kinda motivates me a bit. To see there are other people younger and maybe in worst shape than me.…

How was it a motivator?
Well, I might not have worked as hard but I realized there are people probably worse off.

So you think it made you work harder?
I think it did. Yes. Yup.

**Perceived Progress.** The perceived physical progress the participants made since their initiation to the ‘Reach’ program strengthened their efficacy beliefs. The physical benefits accrued from participation were commonly discussed in terms of physical function (e.g. the ability to “walk better”, “walk farther”, and being “stronger”). The perceived progress “ma[de] things easier” for the women’s activities of daily living such as walking, shoveling, laundry, and
cleaning, as well as exercises during the ‘Reach’ program (e.g. “My arm is coming back. I wasn’t able to do a lot of things in the beginning, but I can do everything now so”). Below is an example that reflects the common themes related to perceived progress and general beliefs about capabilities to do physical activities (e.g. walk farther and better, engage in active transportation):

Every time I walked and every time I started doing things like that I felt healthier. I was like 'hey, I can walk farther and my muscles don't ache' or like you know 'I'm hardly breathing heavily and before I couldn't walk up a hill' you know…when you see a little progression like that over a few weeks it's like 'wow! That’s a big difference here. Like take the stairs, frig the elevator' you know

Social Persuasions. The women discussed how information such as “you can do it” and “it’s great you accomplished that” was sometimes received from other participants in the ‘Reach’ class. Although these example are types of social persuasions and are thus one of the four sources of self-efficacy proposed by Bandura, it was rare for the women themselves to relate this encouragement directly to their self-efficacy beliefs when asked ‘how did this influence you?’.

More generally, the function of encouragement and persuasion in the program was reported by the women as “inspiring”, “gives me motivation, motivation to keep going, ya”, or acted as an “incentive to keep going”. Social persuasion did however reinforce perceptions about the benefits of physical activity for physical function and physical activity ability (e.g. walk better):

Comments that other people give you in how well you are doing or 'I've seen a big improvement in you, boy are you ever doing great'. You know? Um, and then that makes you stop and think 'oh well, you know, these exercises are helping.' Um, like I can lift my walker better, I can walk better, better than I did before.

The types of verbal encouragement provided by other participants during the ‘Reach’ classes were often general in nature as opposed to the expression of confidence in the others’ exercise capabilities or feedback on task-specific activities. However, the exercise instructors provided social persuasion information to the ‘Reach’ participants in the form of emotional (e.g.
encouragement) as well as informational support (e.g. individually-tailored informational feedback) that was more task-specific:

The way it was instructed, like, I just can believe how [the instructor] did that, like you know -'if you are sitting then do this, and if you are standing do this' so, you know, you always had options.

All of the women expressed their appreciation in the instructor’s ability to positively encourage them to “work at your own pace and do what’s best for you” without “pushing [them] beyond [their] capabilities”. This reaffirmed their capabilities in a positive manner:

*How important do you think that ‘reach your personal best’ component was?*

Well it was really good for me because it helped me realized and help me focus on 'ok well I feel like crap today but I know I can do this.' And then once you get there you do a little bit more. So it was kinda, um, it was very positive … you know, helping your health, rather than just saying 'ah that is too hard, I don't want to go today.'

**Physiological States.** Similar to the other three sources of self-efficacy proposed by Bandura (1997), the perceptions of physiological and affective states can exert both positive and negative influences on self-efficacy beliefs. Interpretations of pain, fatigue, and anxiety (physiological) and disappointment (affective) negatively affected the women’s exercise self-efficacy as this information made them question their ability:

Ya, after my surgery I had to think about what I could and couldn’t do, before I never thought about it at all- I just did whatever. But now there is a little bit of fear for stuff, because, like I said, you’ll be in pain after

The instructor assisted with the interpretation of physiological states by encouraging the participants to not push past their personal limits (e.g. “if you are getting too tired go and sit down”). However, negative physiological states (e.g. “short of breath” and “frustrate me”) influenced self-efficacy:
I become very short of breath. And that’s why sometimes I couldn’t walk a lot - I couldn’t do the one minute all the time. And that part used to frustrate me, it used to frustrate me very much because I couldn’t walk for that full minute...I just couldn’t do it. And I didn’t. And I knew I was getting short of breath and [the instructor] kept saying ‘if you are getting too tired go and sit down’

**Barriers and Facilitators to Physical Activity**

All of the women discussed the numerous challenges they encounter to their physical activity participation, and listed a few facilitators. The women indicated different levels of barrier self-efficacy for different perceived barriers. The barriers and facilitators to physical activity are organized into three subthemes: individual, social, and environmental.

**Individual.** The individual challenges to physical activity discussed by the participants were diverse, including pain, stiffness, soreness, sickness, tiredness, mood, laziness, and fear of falling/injury. For most of the women, pain was described as the strongest barrier to attendance as well as participation during class:

If that day I happen to feel really bad, I’ll phone and I’ll explain to [the exercise instructor] when I get there the next session that well I really didn’t feel up to it, no matter what I would have done nothing would have helped.

...If it’s really, if I’m really really really sore- nothing will get me to go. I’ll say ‘okay, I can’t bear it. I don’t think I’ll be able to do the exercise’. I don’t want to go and not able to do the exercise.

Um, if I was in pain- even though I push myself to keep on going but if the pain just became too intense that I couldn’t tolerate it then I would have to go sit down

**Social.** Many of the women expressed their perceived need for encouragement and motivation to be physically active, and acknowledged social support as a potential facilitator of their physical activity behaviour, yet few reported receiving this from family or friends:

...I really seek out social support because that is one thing that I need. Um, kinda just to encourage me to do what I need to do and keep me in a positive mood
I would have to have somebody to encourage me to do it [walk], I wouldn’t do it on my own

I would walk with somebody if I had somebody to walk with. I would

**Environmental.** Environmental barriers to physical activity reported by the women included weather, the built environment (e.g. conditions of sidewalks and streets), perceived safety due to crime, and accessibility (e.g. cost and transportation). Having the ‘Reach’ program indoors was discussed by some of the women as one of their only opportunities to participate in physical activity during the winter.

Climate was the most recurring environmental barriers to physical activity reported by the women. The women described how cold and rainy weather affects their health and ability to be active in the face of increased “pain”, “anxiety”, “soreness”, and poor mood (e.g. “crabby”). Weather as well as aspects of the built environment were strong barriers to exercise program adherence because of their influence on the fear of falling:

Like if it is freezing rain outside I am not going. There is no way, I'm sorry. I'm not risking my life, I'm not falling.

I have to be extra careful in walking with my walker out on the street so that I don’t slip and slide on the stones or on the gravel, um, I can easily fall, I can easily lose my balance, I don’t have the balance like I used to.

The women were aware of different programs and facilities that provided opportunities to be physically active during the winter, but accessibility due to distance, cost, and transportation acted as barriers to their participation. Transportation can also pose a unique challenge for the women due to health conditions and pain:

To get on the bus for 45 minutes totally undos that [water exercises] cause all the good I’ve done for my body I go on the bus and then I’m like crippled from sitting on the bus because I can’t sit on a bus
that long because of my back issues... And so that’s another reason being community-based is important.
Chapter 7

Discussion

The main purpose of this study was to explore the influence of social support and self-efficacy on the physical activity beliefs and behaviours of participants in a peer-mentoring intervention embedded in an exercise program. The community-based exercise program targeted sedentary adults with chronic health conditions from a low-income neighbourhood. The primary aim of the peer mentoring intervention was to increase exercise program adherence by positively influencing the perception of social support and self-efficacy beliefs. The study also explored perceived social support and self-efficacy within the exercise setting, and perceived barriers and facilitators to physical activity and exercise program participation to gain an understanding of the factors that influence physical activity participation and exercise program adherence in the study population. The peer mentoring intervention influenced perceptions of social support, self-efficacy beliefs, and exercise program adherence in intervention participants. The exercise environment also influenced self-efficacy and social support beliefs. Contextual barriers and facilitators to physical activity were identified. Overall, the findings of this study support the use of peer mentoring and other social support and self-efficacy strategies to promote physical activity and exercise program adherence in the adults with chronic health conditions.

Summary of Findings in Relation to the Literature

Social support interventions have been effective at increasing physical activity in adults in the past (Kahn et al., 2002; Resnick et al., 2002). However, little is known about how to best structure social support to promote physical activity and exercise program adherence in adults with chronic health conditions. The current findings suggest that social support via peer mentoring is an effective intervention strategy to increase exercise program adherence in adults.
with chronic health conditions participating in a community-based exercise program. A key finding from the quantitative analysis is that intervention participants showed greater adherence to the exercise program than comparison participants at six weeks. There were no significant differences between intervention and comparison participants on physical activity levels, suggesting that peer mentoring was a stronger influence on exercise program adherence than overall physical activity outside of the ‘Reach’ exercise program.

The aim of the peer mentoring intervention was to increase physical activity and exercise program adherence by positively influencing perceived social support and self-efficacy. The relationships between study variables could not be assessed quantitatively. However, quantitative and qualitative results suggest that peer mentoring enhanced perceptions of social support for physical activity (from mentors) in intervention participants. Increased perceptions of social support may account for the greater exercise program adherence on behalf of intervention participants in contrast to comparison participant who were not paired with a peer mentor and demonstrated lower adherence to the exercise program. These primary findings are in keeping with previous research demonstrating a positive relationship between social support and exercise adherence (Clark, 1999; Courneya & McAuley, 1995; Duncan & McAuley, 1993; Litt et al., 2002; Resnick et al., 2002; Okun et al., 2003); however, the relationship between social support and exercise program adherence could not be assessed quantitatively in the current study. Intervention participants also reported higher perceived family support for physical activity than comparison participants at six weeks, which may also have played a role in exercise program adherence (Ayotte et al., 2010; Eyler et al., 1999; Rovniak, Anderson, Winett, & Stephens, 2002).

Interestingly, no significant differences between intervention and comparison participants were found for barrier self-efficacy at six weeks as hypothesized at the beginning of the intervention study. Additionally, no significant changes were found from baseline to six weeks.
for friend support, barrier self-efficacy, or physical activity within either the intervention or comparison groups. These quantitative findings do not support previous research (Anderson, Wojcik, Winett, & Williams, 2006; Ayotte et al., 2010; McAuley, Jerome, Marquez et al., 2003; Resnick et al., 2002; Rovniak et al., 2002) that have demonstrated that social support primarily affects exercise adherence by directly influencing self-efficacy beliefs. Again, although the study set out to quantitatively test the conceptual model of the direct and mediating effect of social support on exercise program adherence, these relationships could not be assessed quantitatively due to the lack of appropriate statistical tests given study data. However, there are other possible reasons for the lack of change in self-efficacy for intervention participants. Firstly, barrier self-efficacy was the only type of self-efficacy measured quantitatively. Qualitative findings indicate that the peer mentoring intervention positively influenced general exercise-related self-efficacy beliefs, in addition to its influence on barrier-related self-efficacy beliefs. In addition, the small sample size may have masked further influences of peer mentoring on barrier self-efficacy. Limitations to the measurement of self-efficacy are discussed in more detail in subsequent sections. Overall, the quantitative findings of the current study suggest that the peer mentoring intervention increased exercise program adherence in intervention participants and positively influenced perceived social support received from peer mentors, but suggests that peer mentoring did not have a significant influence on barrier self-efficacy or physical activity levels. Qualitative findings provide an in-depth understanding of the peer mentoring experience and its direct and indirect influence on exercise program adherence among participants in the peer mentoring relationship.

Intervention and mentor participants perceived increased general and physical activity-related support that the participants discussed had a direct influence on exercise program adherence. Having ‘someone to talk to about stuff’ increased intervention and mentor
participants’ motivation to adhere to the exercise class as this incentive was not perceived to be provided during the ‘Reach’ class alone. Moreover, the development of a close friendship between the peer partners increased the sense of obligation to attend the intervention for intervention and mentor participants, which was also not facilitated within the exercise program itself. Participants also discussed the influence of informational support and subsequent vicarious learning to their individual perceptions of capabilities to both adhere to the exercise program and perform exercises during the class, indicating a mediating effect of social support on exercise program adherence through its influence on self-efficacy. In contrast to the peer mentoring intervention, the exercise class provided the opportunity for observational role modeling for intervention and comparison participants. These main findings are discussed in the following paragraphs by providing a summary of the influence of social support and self-efficacy within the peer mentoring relationship for intervention and mentor participants, and within the exercise setting for all research participants.

Intervention and mentor participants perceived general and physical activity-related support that went beyond the prescribed peer mentoring relationship. The peer mentoring intervention provided participants with unique opportunity to develop a friendship with someone who could share information and adequately provide advice and guidance based on similar experiences with health, pain, therapy, barriers, and physical activity. In addition, the peer partners were able to express caring, concern, understanding, and empathy for their peer partners based on these shared experiences. The mentors and mentees perceived this unique opportunity as an incentive to attend the exercise class on intervention days. A surprising finding that emerged from the qualitative analysis was the influence of the peer mentoring relationship on participants’ sense of obligation and responsibility to their peer partner. This perceived sense of obligation and feelings of social responsibility on part of mentors and mentees influenced exercise program
adherence by increasing the likelihood that the women would attend an exercise class on intervention days. Thus, the social support provided by peer mentoring influenced exercise program adherence by acting as an incentive, increasing motivation, and creating a sense of social responsibility. Similar social support intervention models such as ‘buddy systems’ have shown to increase the sense of obligation to adhere to physical activity in the past (Thomas et al., 2009; see review Kahn et al., 2002). Qualitative findings thus suggest that social support had a direct influence on exercise program adherence as the participants themselves often attributed their attendance to the exercise program directly to increased perceptions of social support resources such as the sharing of stories, advice, feedback, and empathy.

Qualitative findings suggest that peer mentoring may also have had an indirect influence on exercise program adherence because of its positive influence on self-efficacy beliefs. The information and feedback the peer partners provided each other was perceived to influence vicarious information, social persuasion, and the interpretation of physiological states. The role of informational support was highly influential to self-efficacy beliefs during the mentoring sessions. The women were able to learn about and compare individual experiences with health conditions, physical therapy, pain, physical activity, and exercise with their peer partner (i.e. vicarious information sharing). Verbal vicarious information perceived to influence participants’ beliefs about their own health conditions and abilities to participate in the exercise program when confronted with similar barriers (i.e. barrier self-efficacy), which their partners were able to overcome (i.e. ‘if she can do it, I can do it too’). This included the interpretation of physiological responses to exercise such as pain and the ability to self-monitor pain. In addition, the peer partners in the mentoring relationship provided individualized feedback to each other about their partners’ abilities and progress, and provided encouragement to each other. This type of social support motivated the participants and reinforced their abilities to “keep going” with their
exercise participation in the ‘Reach’ class, and to envision the possibility of continuing to the ‘Reach maintenance’ class (i.e. general exercise self-efficacy). Thus, social support via peer mentoring likely influenced exercise self-efficacy as well as barrier self-efficacy information. Verbal vicarious information and social persuasion sources of self-efficacy may have accounted for indirect influence of social support on exercise program adherence. It is possible that this was not adequately captured by the quantitative analysis of social support and barrier self-efficacy.

This study also sought to explore how social support and self-efficacy beliefs might influence all of the study participants within the exercise setting, to contribute to our understanding of the added benefit of peer mentoring as an intervention strategy to enhance exercise program adherence. The social environment of the ‘Reach’ exercise program promoted positive social integration, engagement, and sense of enjoyment. These perceived benefits of exercise participation are consistent with previous research findings in women (Resnick & Spellbring, 200; Sherwood & Jeffrey, 2000). The most notable difference between participants’ experience of social support in the peer mentoring relationship and that of the exercise setting was the level of intimacy among peers and relevancy of support related to physical activity behaviour specifically. Participants related that the exercise program provided more general and underlying support whereas they felt that the peer mentoring relationship provided support directly related to physical activity and chronic health conditions. With little one-on-one interaction during the exercise class, the opportunity to compare experiences or to provide informational support and feedback was limited. Moreover, in comparison to the peer mentoring intervention in which participants felt a sense of responsibility towards their partners, none of the women expressed feelings of obligation to the peer exercisers within the exercise group.

Past research has suggested that the social environment of exercise settings influences the self-efficacy beliefs of exercise participants (Jerome et al., 2002; McAuley et al., 2005; McAuley
et al., 1999; Turner, Rejeski, & Brawley, 1997). The current study explored the contextual factors within the ‘Reach’ exercise class that influenced the self-efficacy beliefs of all of the study participants. Similar to the peer mentoring intervention, vicarious information was perceived as the most influential source of enhanced feelings of confidence (i.e. self-efficacy) within the ‘Reach’ class. In contrast to the self-efficacy beliefs influenced through the peer mentoring intervention, the exercise class provided vicarious information through observational role modeling. Participants often compared themselves to their visual impressions about their peers and used this information to gauge their own health, abilities, and success. Participants viewed this information as empowering and motivating: ‘if she can do it, I can do it too’. This strong and explicit self-efficacy belief was the most prevalent theme related to self-efficacy within the exercise setting, and seemed to be the most influential source of self-efficacy information for intervention and comparison participants alike. However, unlike the peer mentoring intervention, there was little feedback or encouragement from peers in the exercise class, and exercise instructors gave little feedback on participants’ capabilities or successful performances. Feedback directly related to exercise capabilities may be necessary to adequately target self-efficacy within the exercise setting and thus promote exercise adherence within the study population (Ashford et al., 2010; Bandura, 1997).

In a systematic review of physical activity self-efficacy interventions (Ashford et al., 2010) it was found that interventions that used feedback strategies produced the highest self-efficacy beliefs. Feedback on performances and capabilities is directly related to perceptions of mastery experience, the strongest source of self-efficacy beliefs (Bandura, 1997). According to Bandura, and in line with previous intervention studies (Ashford et al., 2010), perceptions of performance success enhance mastery experience information. Participants did not recall successful performances within the exercise class during the qualitative interviews. In contrast,
participants referred to challenges, barriers, and perceived failures, which have a negative relationship to self-efficacy beliefs (Bandura, 1997). The lack of this type of self-efficacy information may partly account for low exercise adherence according to self-efficacy theory (Bandura, 1997) and applied intervention research (Ashford et al., 2010).

The strong influence of vicarious information in both the peer mentoring intervention and exercise class is consistent with Bandura’s (1997) self-efficacy theory, as well as applied intervention research (Ashford et al., 2010). Ashford and colleges found that techniques that incorporated vicarious learning produced greater self-efficacy than those that did not (Ashford et al., 2010). This finding is in line with Bandura’s theory of self-efficacy that proposes vicarious experience to be the second strongest source of self-efficacy beliefs after mastery experience (Bandura, 1997). In congruence with this review, seeing others perform exercise and learning about others’ exercise experiences (i.e. vicarious information) was also the most influential source of self-efficacy beliefs within the exercise setting as well as the peer mentoring intervention. Despite the strong association between vicarious information and self-efficacy beliefs in various physical activity/exercise intervention contexts, vicarious experience is rarely used as a physical activity intervention strategy (Ashford et al., 2010), and thus it is difficult to compare the descriptive results of this study to that of others. In addition, peer mentoring has never been researched as a means to increase exercise self-efficacy beliefs in the current or similar study populations within a community-based exercise program. The current study increases our understanding of how social support functions to influence self-efficacy and exercise program adherence within a peer mentoring model, as well as the ‘Reach’ exercise program setting.

Peer mentoring provided a means for verbal vicarious information and supportive information and feedback, which was complemented by role modeling in the exercise setting. The
current social support model via peer mentoring increased participant adherence to the ‘Reach’ exercise program, but may have been limited in its effectiveness. The peer partners in the mentoring intervention did not regularly exercise together and thus had little opportunity to role model exercise tasks (i.e. provide observational vicarious information). All study participants expressed that this type of self-efficacy information was the most influential to their beliefs about their personal capabilities to adhere to the exercise program, as well as perform exercises within the ‘Reach’ exercise class. Verbal and informational role modeling may have been perceived as highly influential for the participants because they were inexperienced with exercise program participation and had little experience exercising with similar others outside of the exercise program. Exercising together might increase the likelihood that individualized feedback and encouragement would be provided to each partner, thus influencing the mastery experience source of self-efficacy. Although the peer mentoring intervention as well as the social environment of the exercise class provided positive support resources and self-efficacy information, participants encountered many challenges to their physical activity participation that may have to be addressed to promote physical activity adherence in the study population (Courneya & McAuley, 1995; Schutzer & Graves, 2004).

A third aim of the current study was to explore the perceived barriers and facilitators to physical activity participation in the study population. Participants’ expectations about the benefits of physical activity emerged as a motivator for exercise program initiation in the study population. The women interviewed were knowledgeable about the general health benefits of physical activity, and held beliefs about the potential outcomes of ‘Reach’ exercise participation for their physical and psychosocial health. This is consistent with previous research that indicates that adults are aware of the benefits of physical activity (Ayotte et al., 2010; Crombie et al., 2004; Kolt, Driver, & Giles, 2004; Resnick & Spellbring, 2000). Additionally, health promotion has
been shown to be an important incentive to participation in exercise programs for adults (Kolt et al., 2004). The physical and psychosocial benefits of participation in group-based exercise also facilitated motivation and commitment to the program. In addition, the participants indicated that the exercise program facilitated their physical activity participation due to its accessibility (e.g. community-based and free), indoor space, and positive social environment (e.g. sense of fun, belonging, and support). Participants also indicated that having someone to be active with outside of the ‘Reach’ program would potentially facilitate their physical activity. These identified facilitators to physical activity are also consistent with previous work in similar populations (Jancey et al., 2007).

Participants’ experiences with individual, social, and environmental barriers related to chronic health conditions often made physical activity and exercise program participation a challenge. The strongest perceived barriers to physical activity for the study population were poor health, pain/discomfort, fear of falling, ‘over-doing it’, and bad weather. These barriers are consistent with barriers previously reported in the literature (Brawley et al., 2003; Clark, 1999; Cohen-Mansfield et al., 2003; Crombie et al., 2004; Jancey et al., 2007; King et al., 1998; Newton et al., 2001; Resnick et al., 2001). However, the current study highlights the interdependence and complexity of these barriers for adults with chronic health conditions. For example, weather was a unique barrier for study participants because of its effect on mood, pain, and anxiety that accompany the participants’ health conditions. In addition, the commonly reported barriers of transportation and accessibility were also intensified for study participants because of the influence of these barriers influence on pain. The qualitative interviews increased our understanding of the contextual barriers to physical activity for the study population, and of the influence of chronic health conditions on the complexity of the identified barriers. This
information can be used to facilitate problem-solving activities amongst ‘Reach’ program participants in the future.

An unexpected finding was the relatively high ratings of barrier self-efficacy for study participants on the Barrier Self-Efficacy Scale, given the perceived strength of these barriers reported during the qualitative interviews. Moreover, there was also an unexpected decrease in confidence to overcome barriers to physical activity over time in intervention participants, despite exercise participation and peer mentoring. There are two explanations for these findings. Firstly, the program targeted adults who were inactive, and thus many had little or no experience with potential barriers to their physical activity attempts. Participants may have been unrealistic about their ability to be physically active when confronted with these various barriers at the beginning of the ‘Reach’ class. Hence, the participants may have overestimated their barrier self-efficacy at baseline. Secondly, it is possible that gains in barrier self-efficacy may have been influenced by season; participants indicated during interviews that barriers such as weather, pain, and transportation became stronger as the exercise program progressed into the beginning of the winter months. Participating in the exercise program and experiencing increased barriers may have given the participants a more accurate reference as to the difficulty to continue their physical activity participation when facing these barriers. Alternatively, failing to overcome experienced barriers may have undermined participants’ barrier self-efficacy. Barriers may have influence intervention and comparison group participants differently, depending individual perceived strength of barriers and abilities that may have differed between groups. Decreases in barrier self-efficacy were reported by McAuley and colleagues (2003) from pre-exercise program to 4-months and 6-months in a study with sedentary older adults. Similar to the current study, the decrease in barrier self-efficacy over time was insignificant (McAuley, Jerome, Marquez et al., 2003).
Limitations and Strengths

While this study adds new knowledge to the literature on physical activity, chronic health conditions, social support, and self-efficacy, there are both strengths and limitations to acknowledge. Main limitations of the current study are due to study parameters, purposeful and convenience sampling, sample size, self-reported measures, and possible biases introduced by the researcher during qualitative interviewing and analysis.

First, study findings may be limited to the population and setting of the current study. The current study drew from a convenience sample of adults with chronic health conditions participating in a specific exercise program (‘Reach…Your Personal Best!’) in one low-income neighborhood in Kingston, Ontario. Moreover, the qualitative component consisted of a purposeful sample of women who were retained at 12-weeks. Thus, findings and conclusions of the current study may not be transferable to other exercise programs, locations, or populations, or may be more appropriate when combined with other evidence. The case study design was used to provide adequate detail to enable the reader to judge the transferability of study findings to other contexts and populations.

The small sample size is also a limitation. The sample achieved was smaller than expected due to recruitment difficulties and program compliance. These are common difficulties in populations of older adults in low socioeconomic status neighborhoods (King, Rejeski, & Buchner, 1998). Recruitment difficulties included an unexpected timeline to recruit before the beginning of the first exercise class (5 days), and small class enrollment numbers. The small sample size interferes with the statistical power to detect intervention effects or assess the relationship between study variables, and may limit the generalizability of findings (Fields, 2009; Howell, 2009). Although there were some significant intervention effects found using nonparametric tests, including the significant difference between intervention and comparison
participants on exercise adherence at six weeks, the small sample size may have hidden further
effects (Fields 2009; Howell, 2009). Had the sample been larger, it is more likely that the
assumptions of parametric tests would have been met, and thus parametric tests such as t-tests,
and ANOVAs could have been used to test differences between intervention groups, and
correlations could have been used to test relationships between study variables. In addition,
adequate power would have enabled the ability to assess the mediation effect of self-efficacy on
physical activity and exercise program adherence, as well as the potential mediating effect of
demographic variables such as gender on social support, self-efficacy, and physical activity. The
small qualitative sample size further limits the study. The perceptions of only seven women
participants for qualitative analysis is only a beginning picture of the experience of adults with
chronic health conditions participating in community-based exercise programs in low-income
settings, and the potential influence of peer mentoring as an intervention strategy to promote
exercise program adherence. The beliefs and behaviours of adults with chronic health conditions
in an exercise program in other settings may differ than those in the current study.

The current study also relied on self-reported measures of physical activity, social
support, and barrier self-efficacy for quantitative analysis and recall of past events during
qualitative interviewing. Self-report measures are inherently influenced by bias and measurement
error (Howell, 2009). Recall can be biased by poor memory, social desirability, and lack of
understanding of instructions and/or questions (Howell, 2009), which may have influenced the
physical activity, social support, and self-efficacy quantative findings as well as qualitative
findings.

The use of The Compendium of Physical Activities (Ainsworth et al., 2000) from which
the MET intensities were derived does not take into account individual differences (e.g. age, body
weight, cardiorespiratory fitness, chronic health conditions or disabilities, etc). Thus, the MET
value assigned to an activity may not reflect actual energy costs for a particular person and therefore the MET values reported may be over or under-estimated. It is also difficult to accurately capture activities of short duration, low-intensity physical activity, as well as the energy-expenditure of walking (Tudor-Locke & Myers, 2001). This has serious implications for the current population, since the vast majority of reported physical activities were low-intensity, such as housework, walking, and stretching. Walking is a particularly difficult physical activity to estimate energy expenditure as it is the least reliably recalled physical activity (Tudor-Locke & Myers, 2001). Physical Activity was thus assessed as two variables: physical activity including walking, and physical activity excluding walking. Both physical activity variables excluded housework. The rationale to exclude housework was that the physical demands of such low-intensity activities are inaccurately reported and difficult to quantify (Chasan-Taber et al., 2002; Kriska, 2000). The achievement of recommended levels of physical activity for study participants thus depended on this inclusion criteria and it can be assumed that the proportion of the population that met recommended levels would have increased if housework and walking were both included.

Barrier self-efficacy was selected as the quantitative measure of self-efficacy for the current study as it appeared to be suited for the population and the purposes of peer mentoring. Retrospectively, however, it was clear through qualitative interviewing and experience in the field that both the exercise program and peer mentoring targeted exercise self-efficacy as well as barrier self-efficacy. The exclusion of a quantitative exercise self-efficacy measurement may have contributed to the inability to assess changes in self-efficacy in the study population or the influence of peer mentoring on self-efficacy beliefs. In addition, social support for exercise from ‘family’, ‘friends’ and ‘mentors’ (intervention participants) was assessed quantitatively with little regard for support generated within the exercise class, and thus the influence of co-exercisers and
exercise instructors was not captured quantitatively, further limiting quantitative findings of the influence of social support on exercise program adherence.

With qualitative methods, there is the potential for skewing data by the interpretation of the researcher. One possible threat to credibility is the possibility of over representing some participant perspectives over other participant perspectives. In the current study, the richness of qualitative data varied between interviewees. To add to this limitation, the researcher decided to not include acronyms in place of participants’ individual names as she felt it was easy to match responses with individual participants. However, the researcher attempted to report themes that were common to all participants interviewed and also identified examples that were not shared by all participants. Various verbatim quotes were used to support findings.

The findings of the current study are largely based on the experiences of the women participants of the ‘Reach’ program. The researcher was not a member of the sample population with regards to age, socioeconomic status, location, or health status. These differences could influence the collection and interpretation of data. To reduce this bias, the researcher participated in every ‘Reach’ session with the participants, which enabled a greater understanding of the participants’ context and experiences. Additionally, the researcher developed and maintained good rapport with participants to enable the open sharing of information during qualitative interviewing. The familiarity with each participant and their context, coupled with good rapport, assisted with the confirmability of the study findings. However, it must be acknowledged that it is possible the presence of the researcher during each exercise class may have influenced participants’ behaviours. It is also possible that establishing a relationship with participants may have increased the likelihood of social desirability bias during both quantitative and qualitative data collection.
There are also many strengths of the current study. The first strength was that the research problem was identified by the community health center and thus findings have practical relevance for future program planning and community members. The second strength of the current study is the use of a theoretical framework to guide intervention development and analysis. The use of the framework enables the extension of study findings into the current body of knowledge on physical activity, social support, and self-efficacy interventions. Thirdly, the current study used both quantitative and qualitative methods to explore the research problem. Although the small sample size reduces the likelihood the sample is representative of the population, the quantitative component provides some insight for the effectiveness of peer mentoring as an intervention strategy to increase exercise program adherence, and the perceived barriers to physical activity for the study population. Additionally, qualitative findings provide important insight into the complexity of perceived barriers of physical activity and exercise program participation, factors that influence self-efficacy, and the importance of social support and self-efficacy information within the exercise setting from the perspective of ‘Reach’ participants. The qualitative component of the study also provided important information to the health center about the effectiveness and feasibility of peer mentoring as a strategy to improve exercise program participation of ‘Reach’ exercise participants. The information provided by this study leads to a greater understanding of how self-efficacy information sources can be manipulated by social support for physical activity within the ‘Reach’ exercise setting or alternatively, by one-on-one peer mentoring. Quantitative and qualitative findings can be used to design and implement future programs, to compare results of future studies, and to apply for funding for future programs on behalf of the Kingston Community Health Centres.
Future Research

Further research is needed to support the use of peer mentoring as an intervention strategy aimed to increase exercise program adherence in adults with chronic health conditions. With regards to the implementation, longer peer mentoring training is recommended to develop the mentoring skills necessary to support the physical activity and exercise program adherence of mentee participants and adequately target self-efficacy sources. In addition, it is suggested that the intervention partners are provided with an outline of conversation topics to facilitate direct support for physical activity, and further target self-efficacy information.

With regards to the implementation of the study, a process evaluation of the peer mentoring intervention is suggested to gain a better understanding of the dose, quality and fidelity of the intervention, and the relationship of intervention components to outcomes. In addition, the inclusion of both a task-specific and barrier-based self-efficacy tool would have enhanced research findings. A more situation-specific self-efficacy tool could be developed for the particular population and specific exercises performed within the ‘Reach’ exercise class (Clark, 1999). Qualitative interviews at different time points throughout intervention studies should be considered to better assess the changes in participants’ perceptions over time. Moreover, it would be beneficial to interview intervention drop-outs in the future to gain a better understanding of peer mentoring as an intervention strategy to increase exercise program adherence in adults with chronic health conditions participating in community-based exercise programs in low-income neighbourhoods.

In terms of the sample, a larger sample size that is representative of the population is recommended for future studies. A larger sample size would increase statistical power to detect intervention effects and enhance the generalizability of the statistical findings of the current study. In addition, participants should be randomized into intervention and comparison groups in
future studies to help assure the internal validity of study outcomes. To preserve the benefits of randomization, an intention-to-treat analysis should be conducted, in which participants are kept in the analysis of their original groups, regardless of whether they drop-out of the intervention.

**Recommendations for Practice**

Helping middle-aged to older adults adhere to exercise is a challenge (Clark, 1999; Resnick & Spellbring, 2000). Strategies such as enhancing social support and targeting self-efficacy within the ‘Reach’ exercise program, minimizing the perceptions of barriers, and problem-solving strategies to overcome barriers to physical activity for the study population holds promise.

The perceived motivators for group-based exercise for study participants included health benefits, social interaction, and enjoyment. Findings show that health benefits of physical activity should be acknowledged and reinforced during the ‘Reach’ exercise class to influence participants’ motivation to adhere to the program. This can be done during the exercise class by instructors, as well as during the post-exercise educational/social time included in the ‘Reach’ program. Additionally, the social aspects of group-based exercise should be emphasized and facilitated within the exercise program to enhance perceptions of enjoyment and social support (Sherwood & Jeffrey, 2000). Participants should be encouraged to interact and socialize with each other as they exercise, as well as to provide support to each other in the form of encouragement and feedback. Peers can share information about personal strategies to overcome barriers, and time can be allocated to brainstorm and problem-solve new solutions to barriers. This can also be incorporated into the education/social hour at the end of each ‘Reach’ class.

Based on findings from this study and previous research, it is important to enhance self-efficacy and social support for physical activity in this population (Duncan & McAuley, 1993; O’Brien Cousins, 1997; Sherwood & Jeffery, 2000; Resnick et al., 2002). This study supports
previous research that has shown self-efficacy to be influenced by social support in middle-aged to older adults (Clark, 1999; Duncan & McAuley, 1993; O’Brien Cousins, 1997). Thus, promoting a supportive environment and the provision of support by co-exercisers and instructors is important for the promotion of exercise program adherence. Although the peer mentoring model influenced perceived social support and self-efficacy beliefs as well as exercise program adherence, it may not be the most feasible and effective intervention strategy for the current ‘Reach’ exercise program unless it is combined with other strategies in the exercise setting to promote social support and self-efficacy.

The strongest source of self-efficacy information is mastery experience, or the perception of successful performance (Bandura, 1997). Thus, it is important that this perception be facilitated to increase exercise program adherence. Previous research has shown that establishing small goals can enhance self-efficacy among older adults (Shilts, Horowitz & Townsend, 2004). Given the little acknowledgement of performance success during qualitative interviews, participants should be encouraged to set realistic goals that can be achieved to enhance perceptions of mastery experience. Participants should also be encouraged to acknowledge and celebrate personal successes, as well as general accomplishments related to their exercise participation (e.g. increased flexibility or decreased pain) to further enhance perceptions of mastery experience. Perceived physical progress emerged as an important motivator for continued exercise program participation. It may be helpful to use activity logs or pedometers to track success (Lee et al., 2008; McAuley et al., 1994; Williams & Lord, 1995); however, participants in this study had low compliance for activity journals and expressed contempt for them. Therefore, the exercise instructor can assist with the interpretation of mastery experience by acknowledging and reinforcing successes and individual progress, as well as provide feedback regarding exercise
performance (Sherwood & Jeffrey, 2000). Funding can be allocated to provide pedometers to ‘Reach’ participants.

Participants within the exercise class can also be encouraged to support their peers by acknowledging and reinforcing others’ performance accomplishments and by providing feedback to each other. These types of peer support could assist with the interpretation of mastery experience (Bandura, 1997). Although verbal encouragement alone may not be strong enough to enhance the social persuasion source of self-efficacy (Bandura, 1997; Lee et al., 2008), encouragement from others can assist with the interpretation of achievements, and thus influence the mastery source of self-efficacy beliefs. Verbal encouragement from a credible source has been shown to improve exercise behaviour in the past (King et al., 1998; Lee et al., 2008; Resnick, 1998).

Vicarious experience can be influenced by seeing or learning from a similar others’ achievements (Bandura, 1997). The ‘Reach’ exercise class already provides this opportunity for participants. However, this source of self-efficacy information can be enhanced by having participants demonstrate exercises, and by providing comparative feedback and praise to participants against the performance of similar others (Ashford et al., 2010). There is very little evidence of effective strategies to use vicarious information as an exercise intervention strategy (Ashford et al., 2010; Lee et al., 2008), but studies that do provide this type of information greatly enhance self-efficacy (Ashford et al., 2008). Based on the findings of the current study, pairing participants to exercise together as well as providing feedback may enhance vicarious information related to self-efficacy beliefs. The peer mentoring component of the current study increased vicarious information related to self-efficacy beliefs in study participants. This type of relationship can be promoted within the exercise setting by pairing individuals during exercise. Moreover, a buddy system could be established to encourage participants to meet outside of the
‘Reach’ exercise program to engage in physical activity together. Buddy system and walking groups have shown to increase physical activity and exercise program participation in the past (Kahn et al., 2002). A recommendation is to allocate resources to support these extra-program activities (e.g., provide a gift card to individuals so individuals can meet for coffee).

It is important to educate and assist ‘Reach’ participants with the interpretation of physical signs and symptoms related to exercise, given the reported barriers of pain and shortness of breath and the relationship of negative affective states to self-efficacy (Bandura, 1997). Peers and exercise instructors can assist with the interpretation of physical responses to exercise and reinforce the long-term benefits of exercise on such symptoms as pain and shortness of breath. Assisting with the interpretation of negative physiological and affective states has been shown to be essential in promoting self-efficacy in older adults (Resnick, 2002).

All the sources of self-efficacy should be manipulated within the exercise setting to increase exercise program adherence to the ‘Reach’ exercise class. Exercise peers and well as instructors can assist with interpretations of mastery and vicarious experience and physiological states. It is important to encourage and maintain participants’ confidence in their personal abilities to be active to promote physical activity and exercise program adherence in the study population. This can be done using peer support strategies within the exercise setting, as well as support for physical activity from the exercise instructor (Bandura, 1997; Lee et al., 2007; Resnick et al., 2002).

**Conclusion**

The current study supports the use of peer mentoring as an intervention strategy to increase exercise program adherence in adults with chronic health conditions participating in a community-based exercise program. Peer mentoring should be complimented by other social support and self-efficacy strategies within the exercise setting to effectively promote exercise...
program adherence in adults with chronic health conditions participating in a community-based exercise program. Instructors should encourage participants to interact and socialize with each other as they exercise, provide support to each other in the form of encouragement and feedback, and share information about personal strategies to overcome barriers. Instructors should reinforce participant accomplishments and assist with the interpretation of negative responses to exercise such as pain and fatigue. The current study contributes to social support, self-efficacy, and physical activity promotion research and practice.
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Appendix A
Recruitment Materials and Letters of Information

1. Recruitment Flyer

FREE!
*12-Week Physical Activity Program*

What: Reach... Your Personal Best! is a gentle exercise, healthy snack, and education program for adults with health conditions or disabilities who have never or rarely exercised.

*Health conditions may include: back problems, diabetes, high blood pressure, arthritis, joint problems, obesity (and many others!)

Benefits: The goal is to improve participants’ abilities to do activities of daily living with greater ease, and enhance healthy eating and well-being.

ITS FUN! AND FREE!
Guest speakers, social time and food&drinks provided

When: Tuesdays and Thursdays starting Sept. 28, 2010!
Time: 1:30pm – 3:30 pm
Where: ***
*Assistance with transportation available upon request*

CALL!
North Kingston Community Health Centre
Please Call: **or **at 613 *** Ext. ***
to register or for further information.
*Ask about referral from a health care practitioner *
RECRUITMENT SCRIPT

Social Support and Physical Activity Project

Hi,

My name is Amanda Northcott and I'm a Masters student at Queen's University. I am running a study on the influence of social support on physical activity and was wondering if I could have five minutes of your time to tell you about the project and ask if you would like to participate.

More information:

The purpose of this project is to evaluate the influence of peer mentoring on physical activity levels in adults with health conditions.

Participants: Some participants will be encouraged to have contact with an adult from the community who is currently living with a health condition and is physically active. This individual will act as a source of support, a 'mentor'. We will encourage you to meet with your mentor face-to-face at least once per week, which may take place before your exercise class on Thursdays, or at a more convenient time.

Mentors: I am looking for adults in the community who have already completed at least one rotation of the 'Reach' program at the North Kingston Community Health Centre to act as physical activity mentors to new participants in the 'Reach' program.

The mentors will act as a source of support to the beginners of the 'Reach' program, providing encouragement and strategies to begin and continue exercising in the community. It will not cost you anything to become a mentor.

Is this something you would be interested in, or interested in knowing more about?

Yes- Letter of Information and contact information
No- Okay, thank you for your time.

YES - Thank you very much! I will just a take a quick minute to give you some more information about the project, I can also give you a printed letter of information for you to take and read. I will not be asking any personal information at this time, but will ask for your contact information.

NO- Thank you for your time.
3. Participant Letter of Information

Main Researcher: Amanda Northcott  
M.Sc Student, Health Promotion  
School of Kinesiology and Health Studies  
Queen’s University  
4an6@queensu.ca

LETTER OF INFORMATION

What is the title of the project? Social Support and Physical Activity: The influence of peer mentoring on physical activity levels among adults with chronic health conditions

What is this project about? The purpose of this project is to evaluate the influence of peer mentoring and other sources of social support on physical activity levels. The project will involve participation in a 12-week physical activity program offered by the North Kingston Community Health Centre (NKCHC) for adults with various health conditions. The program is called ‘Reach...Your Personal Best!’ You will be asked to complete a 20 minute survey at the beginning of the program, at 6-weeks, and after the program is complete. If you agree, an assistant will measure your height, weight, and waist circumference. You will also be asked to keep record of physical activities you do outside the ‘Reach’ program during the 12-weeks of the project on a physical activity log that will be provided to you.

Some participants will be encouraged to have contact with an adult from the community who is currently living with a health condition and is physically active. This individual will act as a source of support, or physical activity ‘mentor.’ We will encourage you to meet the your ‘physical activity mentor’ face-to-face at least once per week, which may take place after the physical activity session on Thursdays, or at a more convenient time. Those individuals paired with a physical activity mentor will be asked to keep note of the activities and time they spend with their mentor as well as their reflections of this time and their relationship with the mentor. This will also be completed on the activity log provided to you. There are no known risks associated with your participation in this project, however a doctor’s referral is required.

This study has been granted clearance according to the recommended principals of Canadian ethics guidelines and Queen’s policies.

Is my participation voluntary? Yes. Your participation is 100% voluntary. It would be greatly appreciated if you fully participate in the program and answer all questions to the best of your ability; however, you are able to withdraw from the project at any time and for any reason. If you would like to withdraw from the project, please contact Amanda Northcott at the contact information provided below. If you choose to withdraw from the
project, you are still welcome to participate in the ‘REACH’ program offered by the NKCHC. You may also choose not to answer any questions you do not wish to.

**What will happen to my responses?** We will keep your responses confidential. Only the main researcher and program facilitators will have access to this information. All identifying information will be kept separate from survey answers by the use of a unique identification code that you will create on the consent form and use on each survey and activity log instead of your name. The unique identification code can only be matched to your personal information by the main researcher and will be kept separate from survey answers in a separate locked file unless needed to identify withdraw from the program. The information you provide may also be published in professional journals or presented at scientific conferences, but any such presentation or sharing will be of general findings and we will ensure your privacy. Identifying information will not be shared in any form without consent. Should you be interested, you are entitled to a copy of the findings, in which time we will ask you for your contact information. If you choose to withdraw from the project, information you provide up to the point of withdraw will be used as part of the research project unless otherwise requested. If you would like any of this information removed, we will have to ask you to provide your unique ID and contact information, so we can identify and remove your answers.

**Will I be compensated for my participation?** Assistance with transportation will be provided upon request, as well as assistance with childcare at the NKCHC. There will be food and beverages available at each session of the ‘Reach... Your Personal Best!’ program.

**What if I have concerns?** In the event that you have any complaints, concerns, or questions about this project please feel free to contact myself (Amanda Northcott); 4an6@queensu.ca; my project supervisor, Dr. Brenda Bruner at brendab@nipissingu.ca; or Dr. Lucie Lévesque at levesqul@queensu.ca; School of Kinesiology and Health Studies Director, Dr. Jean Côté <613-533-6000 x 75773>; or the Chair of the General Research Ethics a Queen’s University <613-533-6081> (chair.GREB@queensu.ca).

Thank you for your interest in this program. Participation in this project is greatly appreciated.
4. Participant Consent Form

Main Researcher: Amanda Northcott
M.Sc Student, Health Promotion
School of Kinesiology and Health Studies
Queen’s University
4an6@queensu.ca

Consent Form

I, ________________ (print full name), have read the description of the project “Social Support and Physical Activity: The influence of peer mentoring on physical activity levels among adults with chronic health conditions” and accept to participate.

I have read and retained a copy of the letter of information concerning the project and all my questions have been sufficiently answered.

I understand what is required for participation in the project. I understand that I will participate in a 12-week physical activity program called “Reach... Your Personal Best!” offered by the North Kingston Community Health Centre. I understand that some participants will be randomly assigned a ‘peer mentor’ that will act as a source of social support for physical activity. I will complete a questionnaire at three time points (i.e., before the project, at 6-weeks, and after the project at 12-weeks) and, with permission, will have my height, weight and waist circumference measured before and after the ‘Reach’ program. I also understand that I will be asked to complete an activity log as part of my participation in the study.

I understand that, upon request, I may have a full description of the results of the project after its completion and that the researchers intend to publish the findings of the project.

I understand that my participation in the project is completely voluntary and that I am free to participate in only the parts I choose and can withdraw at any time. I am also aware that my decision to take part or not to take part in this project will not affect any current or future services provided by Queen’s University and/or the North Kingston Community Health Centre. Finally, I understand that my confidentiality will be protected throughout the project.

Should I have further questions I am aware that I can contact any of the following individuals:

- Amanda Northcott: Researcher, email: 4an6@queensu.ca
- Brenda Bruner: Project Advisor, email: brendab@nipissingu.ca
- Dr. Lucie Levesque: Project Advisor at levesqul@queensu.ca
- Dr. Jean Côte: Director of School of Kinesiology and Health Studies at Queen’s University, phone: (613) 533-6080 x 75773, email: jec46@queensu.ca
- Dr. Joan Stevenson: Chair of the General Research Ethics Board at Queen’s University, phone: (613) 533-6081, email: chairGREB@queensu.ca

Signature: ____________________________ Date: ____________________________

ID: ____________________________
(First 3 letters mother’s maiden name and last 4 digits of phone number)
Example: Bon8599
What is the title of the project? Social Support and Physical Activity: The influence of peer mentoring on physical activity levels among adults with chronic health conditions.

What is this project about? The purpose of this project is to evaluate the influence of peer mentoring and other sources of social support on physical activity levels. Participants in the ‘Reach’ program offered by the North Kingston Community Health Centre (NKCHC) will be randomly assigned to one of two groups: (1) individuals paired with a physical activity peer mentor and (2) individuals without a peer mentor. The peer mentors are adults who have previously completed at least one rotation of the ‘Reach’ program and are now enrolled in the maintenance ‘Totally Active People’ (TAP) program at the NKCHC.

Each mentor will be asked to attend one session on social support and physical activity, and have weekly contact with an adult from the ‘Reach’ program with the goal of providing support to the individual to be physically active in the community. We will encourage you to meet the participant you are paired with from ‘Reach’ face-to-face at least once per week, which can be done in the 30 minutes between ‘Reach’ and ‘TAP’ on Thursdays, or at a more convenient time. Also, you will be asked to complete a 20 minute survey at the beginning of the program, at 6-weeks, and after the program is complete. You will also be asked to keep a record of your physical activities outside the ‘TAP’ program during the 12-weeks of the project. A physical activity log book will be provided to you to track your other activities. We will also ask you to write down the time you spend with participants from ‘Reach’ and your and your reflections of the time and relationship with this individual in your log book.

This study has been granted clearance according to the recommended principals of Canadian ethics guidelines and Queen’s policies.
Is my participation voluntary? Yes. Your participation is 100% voluntary. It would be greatly appreciated if you fully participate in the program and answer all questions to the best of your ability, however, you are able to withdraw from the project at any time and for any reason. If you would like to withdraw from the project, please contact Amanda Northcott at the contact information provided below. If you withdraw from the project, you are still welcome to participate in the ‘Totally Active People’ program offered by the NKCHC. You may also choose not to answer any questions you do not wish to at any time.

What will happen to my responses? We will keep all information and responses provided as part of the ‘Totally Active People’ and current project confidential. Only the main researcher and program facilitators will have access to this information. All identifying information will be kept separate from survey answers by the use of a unique identification code that you will create on the consent form and use on each survey and activity log instead of your name. The unique identification code can only be matched to your personal information by the main researcher and will be kept separate from survey answers in a separate locked file unless needed to withdraw from program. The information you provide may also be published in professional journals or presented at scientific conferences, but any such presentation or sharing will be of general findings and individual confidentiality will not be breached. Identifying information will not be shared in any form without consent. Should you be interested, you are entitled to a copy of the findings, in which time we will ask you for your contact information. If you choose to withdraw from the project, information you provide up to the point of withdraw will be used as part of the research project unless otherwise requested. If you would like any of this information removed, we will have to ask you to provide your unique ID and contact information, so we can identify and remove your answers.

Will I be compensated for my participation? Assistance with transportation will be provided upon request, as well as assistance with childcare at the NKCHC. There will be food and beverages available at each session of the ‘TAP’ program.

What if I have concerns? In the event that you have any complaints, concerns, or questions about this project please feel free to contact myself (Amanda Northcott); 4an06@queensu.ca, my project supervisor, Dr. Brenda Bruner at brendab@nipissingu.ca or Dr. Lucie Lévesque at levesqule@queensu.ca; School of Kinesiology and Health Studies Director, Dr. Jean Côté <613-533-6000 x 75773>; or the Chair of the General Research Ethics a Queen’s University <613-533-6081> (chair.GREB@queensu.ca).

Thank you for your interest in this program. Participation in this project is greatly appreciated.
6. Mentor Consent

Consent Form

I, ________________________________ (print full name), have read the description of the project “Social Support and Physical Activity: The influence of peer mentoring on physical activity levels among adults with chronic health conditions” and accept to participate.

I have read and retained a copy of the letter of information concerning the project and all my questions have been sufficiently answered.

I understand what is required for participation in the project. I understand that I will act as a physical activity mentor for adults in the ‘Reach…Your Personal Best!’ program offered by the North Kingston Community Health Centre. I understand that I will attend an introductory session and will complete a questionnaire at three time points (i.e., before the project, at 6-weeks, and after the project at 12-weeks). I also understand that I am asked to have contact with my partner from ‘Reach’ at least once a week and complete a physical activity and mentor activity log as part of my participation in this study.

I understand that, upon request, I may have a full description of the results of the project after its completion and that the researchers intend to publish the findings of the project.

I understand that my participation in the project is completely voluntary and that I am free to participate in only the parts I choose and can withdraw at any time. I am also aware that my decision to take part or not to take part in this project will not affect any current or future services provided by Queen’s University and/or the North Kingston Community Health Centre. Finally, I understand that my confidentiality will be protected throughout the project.

Should I have further questions I am aware that I can contact any of the following individuals:

- Amanda Northcott: Researcher, email: 4an6@queensu.ca
- Brenda Bruner: Project Advisor, email: brendab@nipissingu.ca
- Dr. Lucie Lévesque: Project Advisor at levesquil@queensu.ca
- Dr. Jean Côté: Director of School of Kinesiology and Health Studies at Queen’s University, phone: (613) 533-6000 x 75773, email: je46@queensu.ca
- Dr. Joan Stevenson: Chair of the General Research Ethics Board at Queen’s University, phone: (613) 533-6081, email: chair.GREB@queensu.ca

Signature: ___________________________ Date: ___________________________

ID: __________________________________________ (First 3 letters mother’s maiden name and last 4 digits of phone number) Example: Bon8599
7. Interview Letter of Information

Main Researcher: Amanda Northcott
M.Sc Student, Health Promotion
School of Kinesiology and Health Studies
Queen’s University
4an6@queensu.ca

LETTER OF INFORMATION

With this letter, we are inviting you to participate in a one-on-one interview for the research project entitled “Benefits and Barriers of Social Support and Physical Activity: An exploratory case study of a peer mentoring intervention targeting sedentary adults with chronic health conditions”. This project is conducted by Amanda Northcott, and project supervisors Dr. Brenda Bruner and Dr. Lucie Lévesque in the School of Kinesiology and Health Studies of Queen’s University.

What is this project about? As you may recall, the purpose of this project is to evaluate the influence of peer mentoring and other sources of social support on physical activity beliefs and behaviours. Your participation has involved a 12-week physical activity program offered by the North Kingston Community Health Centre (NKCHC) and participation for some participants in an additional peer mentoring intervention program designed by the researchers. As part of the project, we are inviting you to participate in a one-on-one interview about your experiences and views of social support and physical activity, as well as the peer mentoring intervention. If you agree to participate, you will be interviewed by Amanda Northcott (main researcher) at a mutually convenient time and location. The length of the interview will be approximately one hour. With your permission, the interview will be audio recorded and transcribed.

This study has been granted clearance according to the recommended principals of Canadian ethics guidelines and Queen’s policies.

Is my participation voluntary? Yes. Your participation is 100% voluntary. It would be greatly appreciated if you fully participate in the interview and answer all questions to the best of your ability; however, you are able to withdraw from the project at any time and for any reason with no negative consequences. You may also choose not to answer any questions you do not wish to. There are no known risks associated with your participation in this interview or project.

What will happen to my responses? Data collected will be used in Amanda Northcott’s M.Sc thesis. The researchers intend to publish the findings of the project. We will keep your responses confidential. The following measures will be enacted to ensure your privacy:

- Only the main researcher and project supervisors will have access to the recorded interview and transcribed data, as well as all other information gathered as part of your participation in this study.
- All identifying information will be removed in data files and will not be used in published work or presentations.
- All data will be stored and locked in an office at Queen’s University.
- The tapes recordings of your interviews will be erased after transcription.
- Should you be interested, you are entitled to a copy of the findings, at which time we will ask you for contact information.

Will I be compensated for my participation? Assistance with transportation will be provided upon request. Food and beverages will be available at the time of the interview.

What if I have concerns? In the event that you have any complaints, concerns, or questions about this project please feel free to contact myself (Amanda Northcott), 4an6@queensu.ca; my project supervisors, Dr. Brenda Bruner at brenda.brunner@queensu.ca and Dr. Lucie Lévesque levesque@queensu.ca; School of Kinesiology and Health Studies Director, Dr. Jean Côté (chair.GREB@queensu.ca); or the Chair of the General Research Ethics a Queen’s University <613-533-6081> (chair.GREB@queensu.ca).
8. Interview Consent

Main Researcher: Amanda Northcott
M.Sc Student, Health Promotion
School of Kinesiology and Health Studies
Queen’s University
4an6@queensu.ca

Consent Form

I, __________________________________________ (print full name) agree to participate in the interview component of the project entitled “Benefits and Barriers of Social Support and Physical Activity: An exploratory case study of a peer mentoring intervention targeting sedentary adults with chronic health conditions” conducted by Amanda Northcott, and Dr. Brenda Bruner and Dr. Lucie Lévesque.

I have read and retained a copy of the letter of information concerning the interview and all my questions have been sufficiently answered.

I understand what is required for participation in the interview. I understand that I will participate in an approximately one hour interview with the main researcher, Amanda Northcott.

I understand that, upon request, I may have a full description of the results of the project after its completion and that the researchers intend to use the data for Amanda Northcott’s M.Sc thesis and intend to publish the findings of the project. I also understand that my privacy will be protected in any publications.

I understand that with my permission, the oral interviews will be audio recorded and erased after they are transcribed.

I understand that my participation in the project is completely voluntary and that I am free to participate in only the parts I choose and can withdraw at any time. I am also aware that my decision to take part or not to take part in this project will not affect any current or future services provided by Queen's University and or the North Kingston Community Health Centre. Finally, I understand that my confidentiality will be protected throughout the project.

Should I have further questions I am aware that I can contact any of the following individuals:

- Amanda Northcott: Main researcher, email: 4an6@queensu.ca
- Brenda Bruner: Project Advisor, email: brenda.bruner@queensu.ca
- Dr. Lucie Lévesque: Project Advisor, email: levesqul@queensu.ca
- Dr. Jean Côté: Director of School of Kinesiology and Health Studies at Queen’s University, phone: (613)533-6000 x 75773, email: je46@queensu.ca
- Dr. Joan Stevenson: Chair of the General Research Ethics Board, phone: (613) 533-6081, email: chair.GREB@queensu.ca

☐ I agree to have this interview audio recorded.

ID: ______________________________

Signature: ___________________________ Date ________________________
Appendix B
Questionnaires

Section 1. Demographics questionnaire

ID: ______________________

Demographic Questions

Date of Birth: month________ day________ year________

Gender: □ Male  □ Female

Race/Ethnicity: □ White  □ Black  □ Asian
□ Hispanic  □ Aboriginal  □ Other________

Education: (Highest Level Achieved) □ Unknown  □ None  □ Primary
□ Secondary  □ College  □ University

Employment Status: □ Unemployed  □ Part-time  □ Full-time
□ Student  □ Do not wish to answer

Combined Annual Income of Everyone in Household
□ $0-$14,999  □ $30,000-$34,999
□ $15,000-$19,999  □ $35,000-$39,999
□ $20,000-$24,999  □ $40,000-$59,999
□ $25,000-$29,000  □ Over $60,000
□ Do not know  □ Do not wish to answer

Who lives in your household?
□ Mother/Father/Child or Children  □ Couple
□ Single Mother Family  □ Single Father Family
□ Only Person In House  □ My siblings (brothers or sisters)
□ Extended Family  □ Grandparents with Grandchildren
□ Unrelated House Mates  □ Same Sex Couple  □ Male
□ □ Female

Height: ______________________  Weight: ______________________

Health Status:
In general, I rate my health status as:

Excellent  Very Good  Good  Fair  Poor
□ □ □ □ □
Section 2. Physical activity questionnaire.

**PHYSICAL ACTIVITY**

*Read* the list of activities and ask participants to indicate all activities listed below that they participated in during the PAST MONTH, not including activities during the 'Reach' program.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Football</th>
<th>Golf</th>
<th>Heavy housework (mopping, scrubbing, vacuuming)</th>
<th>Stretching</th>
<th>Yoga</th>
<th>Other (list)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerobics</td>
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<tr>
<td>Badminton</td>
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<td>Baseball/softball</td>
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<tr>
<td>Basketball</td>
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<tr>
<td>Biking-indoors</td>
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<tr>
<td>Biking-outdoors</td>
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<td>Bowling</td>
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<td>Boxing</td>
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<td>Curling</td>
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<td>Dance</td>
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<td><strong>Total</strong></td>
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</tbody>
</table>

1. List each activity that you circled above in the "Activity" box below.
2. For each activity, record the number of times they participated in the activity each week for the last 4 weeks.
3. For each activity, estimate the average number of minutes that they spent participating each time. Record this in the last box. Only report the time that you were actively participating in the activity.
4. For each activity, record the intensity as Light (light change from normal breathing), Medium (above normal breathing), or Heavy (heavy breathing).
5. For each activity, record where they usually performed the activity: at Home (H), Outside (O), or Facility (F).

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>Number of Times Doing the Activity</th>
<th>Average Number of Minutes You Were Active in the Activity EACH time</th>
<th>Intensity</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Week 1</td>
<td>Week 2</td>
<td>Week 3</td>
<td>Week 4</td>
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</tbody>
</table>

130
2. In general, how many HOURS per DAY do you usually spend watching TV? _____ hrs

3. Over this past month, have you spent more than one week confined to a bed or chair as the result of an injury, illness or surgery? Yes____ No_____
   If yes, how many weeks over this past month were you confined to a bed or chair? _____ weeks

4. Do you have difficulty doing any of the following activities?
   a) getting in or out of a bed or chair _____ Yes _____ No
   b) walking across a small room without resting _____ Yes _____ No
   c) walking for 10 minutes without resting _____ Yes _____ No

5. Have you had a job for more than one week over the past month? _____ Yes _____ No

List all JOBS that you had over the past month. Account for all 4 weeks of the past month. **If unemployed/disabled/retired/homemaker/student during all of part of the past month, list as such under job name and indicate the activities of a normal 8 hour, 5 day week.**

<table>
<thead>
<tr>
<th>Job Name</th>
<th>Walk or bicycle to/from work Min/Day</th>
<th>Average Job Schedule</th>
<th>Hours spent sitting at work</th>
<th>Check the category which best describes job activities when not sitting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Weeks/Month</td>
<td>Days/Wk</td>
<td>Hrs/Day</td>
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</tbody>
</table>

**Category A:** Sitting, standing still, light cleaning (ironing, cooking, washing, dusting), driving a bus, taxi, tractor, general office work, occasional short distance walking.

**Category B:** Carrying light loads, continuous walking, heavy cleaning (mopping, sweeping, scrubbing, vacuuming), gardening, painting/plastering, plumbing/welding, electrical work.

**Category C:** Carrying moderate to heavy loads, heavy construction, farming (hoeing, digging, mowing, raking), digging ditches, shoveling, chopping/sawing wood, tree/pole climbing.
Section 3. Social support questionnaire.

**Social Support for Physical Activity**

ID: ________________

It is important for us to understand how the people in your life influence your physical activity behaviour. Below are things people might do or say to someone who is trying to exercise regularly. Please read and given an answer to every question.

These questions are about:
- the past month only
- it does NOT matter how active or inactive you have been during this period

Please rate each questions three times:

1) Family: wife/husband, sister/brother, child/grandchild, other relatives, etc.
2) Friend: close friend, new friends, neighbours, co-worker, club members, etc.
3) Mentor: physical activity mentor you were partnered with at the beginning of the project

**Attention!!!** For each question, please circle three answers. One answer for FAMILY, one for FRIENDS, and one for MENTOR.

<table>
<thead>
<tr>
<th>Example: During the past month, how often have your family, friends, and mentor:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FAMILY</strong></td>
</tr>
<tr>
<td>Never</td>
</tr>
<tr>
<td>1. Made plans with you for doing a physical activity together?</td>
</tr>
</tbody>
</table>

Please start answering questions now.

**During the past month, how often have your family, friends, and mentors:**

| **FAMILY** | **FRIEND** | **MENTOR** |
|-----------------------------------------------|
| Never | Seldom | Sometimes | Often | Very often | Never | Seldom | Sometimes | Often | Very often | Never | Seldom | Sometimes | Often | Very often |

1. Exercised with me | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
During the past month, how often have your family, friends, and mentor:

<table>
<thead>
<tr>
<th></th>
<th>FAMILY</th>
<th></th>
<th>FRIEND</th>
<th></th>
<th>MENTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Gave me encouragement to stick with my exercise program</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>3. Changed their schedule so we could exercise together</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>4. Offered to exercise with me</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
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<tr>
<td>5. Gave me helpful reminders to exercise (“have you exercised today?”)</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>6. Planned for exercise of recreational outings</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>7. Discussed exercise with me</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>8. Talked about how much they like to exercise</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>9. Helped plan activities around my exercise</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>10. Asked me for ideas about how to get more exercise</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>11. Took over chores so I had more time to exercise</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>12. Made positive comments about my physical appearance</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>
Section 4. Barrier self-efficacy questionnaire.

**Exercise Confidence**

**READ:** The items below reflect common reasons preventing people from being physically active. Using the scale below, please indicate how confident you are that you could be physically active in the event that any one of the following circumstances was to occur.

For example, if you have *complete confidence* that you could continue to be physically active even if you were bored by the activity, you would circle 10. However, if you are absolutely sure that you could not be physically active if you were bored by the activity, you would circle 0 (*no confidence at all*).

<table>
<thead>
<tr>
<th>No Confidence At All</th>
<th>Somewhat Confident</th>
<th>Completely Confident</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. I believe that I can be regularly physically active, even if the weather is bad (hot, humid, rainy, snow, cold).</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>2. I believe that I can be regularly physically active, even if I have other demands</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>3. I believe that I can be regularly physically active, even if I am in a bad mood or depressed.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>4. I believe that I can be regularly physically active, even if I feel pain or discomfort when exercising.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>5. I believe that I can be regularly physically active, even if I have to exercise on my own</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>6. I believe that I can be regularly physically active, even if the physical activity is not enjoyable or fun.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
</tbody>
</table>
7. I believe that I can be regularly physically active, even if it becomes difficult to get to the location where I am physically active.

8. I believe that I can be regularly physically active, even if I don’t like the particular activity program that I am involved in.

9. I believe that I can be regularly physically active, even if when I am feeling ill.

10. I believe that I can be regularly physically active, even if I were to feel self-conscious about my appearance while I was active.

11. I believe that I can be regularly physically active, even if I do not receive encouragement from others.

12. I believe that I can be regularly physically active, even if I am under personal stress

ID: ____________________

0  1  2  3  4  5  6  7  8  9  10
Appendix C
Interview Guide

Interview Guide

Time of Interview:
Date:
Place:
Interviewee:
[Describe project: (a) purpose, (b) sources of data, (c) what will be done with the data to protect confidentiality, (d) how long the interview will take.]
[Have interviewee read and sign consent form.]
[Turn on the tape recorded and test it.]

1. Health
[First, I’d like to ask you some general questions about your health and physical activity.]
-Can you tell me about your health?
-Do you have any health issues?
-Do your health issues influenced your participation in physical activity?

2. Physical Activity
(A) Benefits
-Can you describe what physical activity means to you?
-What types of physical activities do you do?
-What are the benefits of being physically active for you?
-What motivates you to be physically active?
-Is there anything that helps you to be physically active (enablers)?
-Has your participation in the ‘REACH’ program changed the amount or types of physical activities that you do?

(B) Barriers
-Do you want to do more physically activity?
-Is it sometimes difficult to be physically active?
-What kinds of challenges (barriers) do you experience to physical activity?
-What do you think could help you to be more physically active?

3. Social Support
[One of the things we are interested in understanding is social support for physical activity.]
-What does social support for physical activity mean to you?
-In what ways do your friends and family influence your physical activity?
-Do your friends or family members encourage you to do physical activity?
-Do your friends or family members discourage you or try to stop you from doing physical activity?
-How important is the influence of your friends and family members on your physical activity?
4. ‘REACH’ program
[Now I am going to ask you some questions about the ‘REACH’ program]
-Why did you decide to join the ‘REACH’ program?
-How many rotations of the ‘REACH’ program have you completed?
-Are you planning on continuing with the program
-What did you enjoy about the program?
-What didn’t you enjoy?
-What would you change about the program?
-Can you remember any of the reasons you missed a ‘REACH’ session?
 -why did that event/issue keep you from attending the class?
-Has program changed your health?
-Has the program influenced your physical activity outside of the program itself?

5. Peer Mentor Intervention
[The next set of questions are about your experiences and perceptions of the peer mentoring
component of the project]
(A) Effectiveness/Explanation
-Can you tell me about your experience with your peer mentor?
-What did you talk about with your peer mentor?
-Do you think you benefited from the peer mentoring experience?
-Did your mentor provide support to you?
-Do you believe your peer mentor influenced you in any way?
[probe: beliefs, confidence, motivation, physical activity, adherence]
-Do you think having a peer mentor influenced your participation in the ‘REACH’ program?
-What did you like about the experience in general?
-Do you believe peer support or mentoring is a useful way to improve participant’s motivation to come to the ‘REACH’ program?
-Do you believe peer support or mentoring is a useful way to increase physical activity?

(B) Feasibility and barriers to implementation
-Would you change anything about the peer-mentoring experience?
-What do you think would make it work better?
-Did you feel that you and your mentor were similar?
-Were you comfortable talking to and meeting your mentor?
-Is there anything else that your peer mentor could have done to help you be more physically active?

DEBRIEF
-Is there anything else you would like to bring up, or ask about, before we finish the interview?
 [ask participant about their experience with the interview]
 [mention main points that were learned and be open to comments/feedback]
 [ask interviewee for permission to use the information provided after the recorder was turned off, after the interview during the informal conversation/debriefing]
Appendix D
Mentor Training Manual

Physical Activity Background

What is physical activity?
Physical activity is any body movement that works your muscles and requires more energy and effort than when you are resting. Examples of physical activity include walking, running, dancing, swimming and bicycling.

The benefits of physical activity.
Physical activity is very important for your health. It offers a range of benefits for all ages and abilities. There is growing evidence of the benefits of physical activity for immediate and long-term physical, psychological and social well being. The adoption of a more physically active lifestyle can add years to life, help prevent many diseases and health conditions, as well as improve functioning and well-being for those with existing health conditions. The benefits of regular physical activity include:

- Better physical and mental health
- Improved fitness and ability to perform daily activities
- Stronger muscles, bones and joints
- Contributes to mental health by helping to protect against stress, anxiety and reducing depression
- Weight control: burn calories and reduce fat
- Improve chronic medical conditions such as diabetes, high blood pressure and heart disease
- Enhances the functioning of your immune system
- Increase energy levels
- Opportunities for new friendships and other social connections and support
- Help prevent diseases such as osteoporosis, heart disease and stroke
- Improve sleeping patterns
- Chance to develop new skills and is associated with other positive health behaviors, such as good nutrition
- Helps build self-esteem and positive self-image

Physical Activity Recommendations

Improving your health with physical activity is easier than you may think. If you are not currently active, you can gain significant health benefits by adding any physical activities into your daily routine. The benefits of physical activity increases as you add more physical activities to your day.

The time you need to be physically active depends on your effort level. According to Canada’s Physical Activity Guide, you need one of the following time and effort levels of physical activity a day to stay healthy:

- 60 minutes of Light Effort: Light physical activities generally allow you to talk while you are doing them because you are not breathing much harder than normal. Examples of light physical activities include:
• Light walking, volleyball, easy gardening, stretching, light housework

- 30-60 minutes Moderate Effort: Moderate physical activities make you feel slightly out of breath. You should feel slightly worn out. Examples of moderate activities include:
  - Brisk walking biking, raking leaves, walking up a hill, swimming, dancing, water aerobics, carrying heavy bags

- 20-30 minutes Vigorous Effort: Vigorous physical activities should make you breathe much harder than normal and you should be sweating. You are really pushing yourself during these activities. Examples of vigorous physical activities include:
  - Aerobics, running, hockey basketball, fast swimming, fast dancing, lifting weights
* can be completed in periods of at least 10 minutes

**Types of Physical Activity**

Canada’s Physical Activity Guide to Healthy Active Living recommends focusing on three different types of physical activity:

1. Endurance
2. Flexibility
3. Strength

Below are examples of activities from each type as well as recommendations for how often you should do each type of physical activity a week:

1. **Endurance Activities (4-7 days a week):**
   Endurance activities are those that increase your heart rate (your heart beats faster) respiratory rate (you breathe harder), and body temperature. You should begin with light activities and, as your fitness level increases and activities become easier, you should add more time to each day.
   - Walking and running
   - Biking
   - Swimming
   - Propelling a wheelchair
   - Household chores such as vacuuming
   - Sports

2. **Flexibility Activities (4-7 days a week)**
   Flexibility refers how far and how easy you can move your joints. Flexibility activities are those that keep your muscles relaxed and flexible and your joints limber and mobile. This helps range of motion and allows daily activities to be performed with less discomfort or strain.
   - Reaching, bending and stretching
   - Yoga, Pilates, T’ai Chi
   - Daily chores including putting away groceries and mopping the floor
   - Yard work such as raking, digging, and others
   - Bowling and curling
3. Strength Activities (2-4 days a week)

Strength activities are those that work your major muscles against some kind of resistance, like when you push or pull hard against something. You should exercise all the major muscles on the left and right side of your arms, mid-section and legs.

- Push-ups
- Lifting and carrying groceries, infants and toddlers
- Heavy yard work, such as cutting and piling wood and raking and carrying leaves
- Climbing stairs
- Sit-ups

Some Physical Activity Statistics and Information

- According to Statistics Canada’s 2007-2008 Canadian Community Health Survey, over 50% of Canadians ages 20+ were considered physically inactive!
- Physical activity levels are lower among women and older persons, as well as in some ethnic minorities in Canada
- A nation-wide trend indicates that activity levels increase with increasing education and household income
- Those who live in Newfoundland and Labrador, P.E.I, New Brunswick, Quebec, Saskatchewan and the North are less likely than average to be moderately active
- The World Health Organization estimates 1.9 million deaths to be associated with insufficient physical activity, via ischaemic heart disease, stroke, type 2 diabetes, colon cancer and breast cancer as the specified causes of death.

Common Barriers to Physical Activity

Barriers to Physical Activity

The following are examples of general barriers and support factors that influence participation in physical activity, as reported by Canadian Parks and Recreation Association at [www.everybodygetstoplay.ca](http://www.everybodygetstoplay.ca)

- High cost of program fees, equipment, clothing, and transportation
- Time
- Self-motivation
- Distance, inconvenience and safety issues
- Poor support and encouragement from family, friends and spouses
- Confidence to be physically active
- Lack of childcare
- Little information about physical activity opportunities in the community
- Health concerns
- Stereotypes, racism, discrimination
- Appropriate programs for community members’ needs

(ideas from mentor participants)
Overcoming Barriers to Physical Activity

Once you identify and understand personal and shared factors that make being physically active difficult, you can create strategies to overcome them and make physical activity part of your daily life!

Below are some suggestions for overcoming physical activity barriers, taken directly from the Centres for Disease Control and Prevention website at [http://www.cdc.gov/physicalactivity/everyone/getactive/barriers.html](http://www.cdc.gov/physicalactivity/everyone/getactive/barriers.html)

<table>
<thead>
<tr>
<th>Suggestions for Overcoming Physical Activity Barriers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lack of time</strong></td>
</tr>
<tr>
<td>Identify available time slots. Monitor your daily activities for one week. Identify at least three 30-minute time slots you could use for physical activity. Add physical activity to your daily routine. For example, walk or ride your bike to work or shopping, organize school activities around physical activity, walk the dog, exercise while you watch TV, park farther away from your destination. Select activities requiring minimal time, such as walking, jogging, or stair climbing.</td>
</tr>
<tr>
<td><strong>Social influence</strong></td>
</tr>
<tr>
<td>Explain your interest in physical activity to friends and family. Ask them to support your efforts. Invite friends and family members to exercise with you. Plan social activities involving exercise. Develop new friendships with physically active people. Join a group, such as the YMCA or a hiking club.</td>
</tr>
<tr>
<td><strong>Lack of energy</strong></td>
</tr>
<tr>
<td>Schedule physical activity for times in the day or week when you feel energetic. Convince yourself that if you give it a chance, physical activity will increase your energy level; then, try it.</td>
</tr>
<tr>
<td><strong>Lack of motivation</strong></td>
</tr>
<tr>
<td>Plan ahead. Make physical activity a regular part of your daily or weekly schedule and write it on your calendar. Invite a friend to exercise with you on a regular basis and write it on both your calendars. Join an exercise group or class.</td>
</tr>
<tr>
<td><strong>Fear of injury</strong></td>
</tr>
<tr>
<td>Learn how to warm up and cool down to prevent injury. Learn how to exercise appropriately considering your age, fitness level, skill level, and health status. Choose activities involving minimum risk.</td>
</tr>
<tr>
<td><strong>Lack of skill</strong></td>
</tr>
<tr>
<td>Select activities requiring no new skills, such as walking, climbing stairs, or jogging. Take a class to develop new skills.</td>
</tr>
<tr>
<td><strong>Lack of resources</strong></td>
</tr>
<tr>
<td>Select activities that require minimal facilities or equipment, such as walking, jogging, jumping rope, or calisthenics. Identify inexpensive, convenient resources available in your community (community education programs, park and recreation programs, worksite programs, etc.).</td>
</tr>
<tr>
<td><strong>Weather conditions</strong></td>
</tr>
<tr>
<td>Develop a set of regular activities that are always available regardless of weather (indoor cycling, aerobic dance, indoor swimming, calisthenics, stair climbing).</td>
</tr>
</tbody>
</table>
| Travel |  Put a jump rope in your suitcase and jump rope.  
|   | Walk the halls and climb the stairs in hotels.  
|   | Stay in places with swimming pools or exercise facilities.  
|   | Join the YMCA or YWCA (ask about reciprocal membership agreement).  
|   | Visit the local shopping mall and walk for half an hour or more.  
|   | Bring your mp3 player your favorite aerobic exercise music.  |
| Family obligations |  Trade babysitting time with a friend, neighbor, or family member who also has small children.  
|   | Exercise with the kids-go for a walk together, play tag or other running games, get an aerobic dance or exercise tape for kids (there are several on the market) and exercise together. You can spend time together and still get your exercise.  
|   | Jump rope, do calisthenics, ride a stationary bicycle, or use other home gymnasium equipment while the kids are busy playing or sleeping.  
|   | Try to exercise when the kids are not around (e.g., during school hours or their nap time).  |
| Retirement years |  Look upon your retirement as an opportunity to become more active instead of less. Spend more time gardening, walking the dog, and playing with your grandchildren. Children with short legs and grandparents with slower gaits are often great walking partners.  
|   | Learn a new skill you’ve always been interested in, such as ballroom dancing, square dancing, or swimming.  
|   | Now that you have the time, make regular physical activity a part of every day. Go for a walk every morning or every evening before dinner.  |

**Local Opportunities to Be Active**

There are many local opportunities to be physically active in the north Kingston community for adults and their families. The following websites have current opportunities for recreation and sport. The North Kingston Community Health Centre and other local organizations also post flyers for recreation opportunities in the community.

[http://www.kchc.ca/active.shtml](http://www.kchc.ca/active.shtml)
[http://www.cityofkingston.ca/residents/recreation/](http://www.cityofkingston.ca/residents/recreation/)

**Social Support and Physical Activity**

*What do we mean by ‘social support’?*

Social support is the comfort and help that is given to us by our family, friends, and others. It can be defined as the feeling of being cared for, loved, and valued by people that are close to the individual, and by whom they trust.

*What are some of the ‘types’ of social support?*

Types and sources of social support may vary, but the most common categories of social support are as follows:

1. Emotional support is the most commonly recognized form of social support and generally comes from family and close friends. It includes concern, caring, love, trust, sympathy, and compassion, among others.
2. Appraisal support involves evaluating and comparing others, and giving them information in the form of feedback, confirmation and approval. It usually comes from family, friends, co-workers and community members.
3. Informational support includes assisting others in the form of helpful advice, suggestions and directions by providing information that can help them accomplish something.
4. Instrumental support is giving a direct type of help, such as driving someone somewhere, committing time to help them with something, or giving money to a friend when they need it.

What does social support have to do with health and physical activity?

Many studies indicated that social support is important for both health and for physical activity behaviour. Evidence suggests that individuals with good social support from family, friends, and others live longer, healthier, and happier lives. People around you influence your thoughts and behaviours, and so social support is associated with habits that influence health, such as drug and alcohol use, smoking, diet and exercise. For example, if your friends are going to go play a game of soccer, you are more likely to play as well. If your husband or wife encourages you to go for a walk and motivates you when you feel tired, you are more likely to go for the walk than if he/she was telling you that you should not go for the walk. Having other people around you that encourage, motivate, and help you increases the chances that you will be physically active.

Why does social support increase physical activity?

There are many reasons why support from others may increase your physical activity. It is thought that different types of social support may increase an individual’s motivation to be physically active, as well as their self-confidence in their ability to be physically active. Also, having other people supporting you makes being physically active more fun., which also increases the chances that someone will be physically active.

Physical Activity Peer Mentoring- What it is (and is not) about!
What is a peer?

A peer is someone who is considered an equal to an individual. For example a peer is ‘equal’ in that they are similar in age or gender, have similar life experiences and can share a common community. Peer support is the giving of help and encouragement by an individual considered an equal.

What is a peer mentor?

A mentor is someone that may have more experience with something and seeks to guide or help a less experienced individual. A peer mentor then is someone who is considered an equal to the individual but can guide or help him or her because of his or her lived experiences.

Physical activity peer mentoring

Physical activity peer mentoring involves pairing individuals who are similar, expect that one has more experience being physically active in the community and would like to help and support the less experienced individual become more physically active.

How does the peer mentor help and support their partner to become more physically active?

We encourage you to help your partner become more physically active by providing basic emotional support – talking, listening, expression concern and encouragement as well as
more direct support as it relates to physical activity—such as information, knowledge, your time and aid.

We encourage you to meet with your partner at least once a week, to talk over the phone or through email. You can plan activities together or meet just to talk about physical activity. We hope that you and your partner build a friendship with each other and that you are a positive physical activity role model.

Below are some of the types of social support that you can provide as a physical activity peer mentor:

- **Positive Role Model/ Commitment to Active Living**
  - Show your partner that you enjoy being physically active, how you have benefited from physical activity and how you are physically active and why they should be too!

- **Communication**
  - Example: call or email your partner to talk about physical activity, how they are doing with their physical activity and why

- **Listening**
  - Example: listen to your partner when they talk about their own experiences and relate/provide feedback to them based on the information that they give you

- **Motivation**
  - Motivate your partner to continue physical activity even if they make excuses or do not feel that they want to continue. Relate it to your own motivation, or the benefits of physical activity

- **Encouragement**
  - Encourage your partner to add physical activities into their daily routines, to be positive about physical activity, and to continue their activities

- **Expression of concern**
  - If your partner talks to you about their problems or difficulties with physical activity, express your concern and give helpful hints and encouragement

- **Relating to your own experiences to help**
  - Relate their experiences with physical activity and health to your own

- **Providing Information**
  - Provide any information about physical activity, where to exercise or play sports, how to be physically active and why, and other types of information about physical activity

- **Talking about Physical Activity**
  - Talk about physical activity!

- **Friendship and Socializing**
  - Be friendly and have fun!