Evaluation of factors influencing engagement in Physical Activity in women during the transition to menopause

Deanne Marie McArthur, RN

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Abstract

Objective: To explore the informational and behavioural factors, that affect women's participation in physical activity (PA) and body weight changes during perimenopause.

Methods: An environmental scan of online health websites to determine availability and quality of information for women about body weight changes during transition to menopause. An interpretive descriptive qualitative study of women age 40 – 60 to explore factors influencing their PA. Descriptive and inductive qualitative analysis were used.

Results: Six of 52 websites (11.5%) contained information specific to perimenopausal women, with one site citing evidence. For 26 women interviewed, the most common enabling factors were daily structure, positive feelings, and accountability; while common barriers were disruptions in daily structure, competing demands, and self - sacrifice.

Conclusions: There is a lack of information regarding body weight changes for perimenopausal women. Perimenopausal women attribute their PA participation to psychosocial factors, and not the physiology of menopause.

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List of Abbreviations

Advanced Practice Nurse	APN
Body Mass Index	BMI
Kilocalorie	kcal
Kilogram	kg
Midlife Women's Attitudes toward Physical Activity	MAPA
Physical Activity	PA
Registered Nurse	RN
Sherbrooke Ottawa Montreal Emerging Team	SOMET
Society for Obstetricians and Gynaecologists of Canada	SOGC

Chapter 1 – Integrated Introduction

Perimenopause is a life stage during which women face increased risk for weight gain and development of obesity. This risk is partially attributable to physiological changes and is compounded by a concurrent reduction in physical activity. Little is known about the factors influencing perimenopausal women's engagement in physical activity. Two studies were undertaken to further understand this aspect of women's lives during perimenopause.

The purpose of this chapter is to provide a review of the background literature and the theoretical basis underpinning these studies.

Background literature

A review of the literature was conducted in May, 2010, using Medline via the PubMed interface with the following key terms: perimenopausal women or menopausal women combined with a) physical activity or exercise b) obesity and/or weight gain c) barriers to exercise or physical activity and d) attitudes toward physical activity. Grey literature searching involved hand searching reference lists of included studies and websites for the Canadian Obesity Network, Canadian Public Health Agency, and Statistics Canada. Literature was included if it was English language and published after 1999.

The background literature review is organized in sections that include menopause and its stages, body weight changes during the transition to menopause, and physical activity in perimenopausal women. More specifically, body weight gain and obesity are discussed as an individual and collective health concern, highlighting the magnitude of the problem with

theoretical and empirical rationale for why women gain weight as they transition to menopause and factors mitigating the effects of weight gain. Physical activity as one preventative factor is discussed within the context of perimenopausal women's current PA behaviours and factors that may influence their participation in PA.

Menopause and its Stages

Perimenopause refers to the period prior to menopause when symptoms of menopause begin and continues for one year after the last menstrual period (Society of Obestetricians and Gynecologists of Canada - SOGC, 2006). Following menarche, a woman's menstrual cycle typically follows a regular pattern (i.e. menstruation every 21 to 35 days) (Soules et al., 2001). The transition through menopause, or 'perimenopause', begins when variation from normal menstruation exceeds seven days, and continues until a woman has encountered amenorrhea for a period of 12 months, at which point she has transitioned from peri to early post menopause (see Figure 1.1). The typical age range for this transition is wide - between 42 and 58 years of age (Soules et al., 2001). The transition to menopause often entails symptoms that can include hot flashes, sleep disruption, weight gain, joint pain, abnormal uterine bleeding, and skin and eye changes (SOGC, 2006).

Changes in Body Weight during Perimenopause

An increased risk for developing obesity as women transition to menopause has been identified in several studies (Ho, Wu, Chan & Sham, 2010, Keller et al., 2010, Lovejoy, Champagne, de Jonge, Xie & Smith, 2008, Lovejoy, 2009, Sowers et al., 2007). Women, on average, gain 2.25kg, with 20% gaining 4.5kg or more during the transition through

menopause (Lovejoy, 2009). Overweight and obesity rates among American women jump from 51.7% for the 20-39 age category to 68.1% for the perimenopausal age group (40-59), and approximately 30% of Canadian women aged 43 to 64 years are obese, suggesting a significant period of weight gain associated with the perimenopausal transition (Keller et al., 2010, Statistics Canada, 2020, Lovejoy, 2009, Matthews, 2001).

This phenomenon exacts a toll on individual women by significantly reducing their chances of healthy survival, and increasing their risk for developing associated co-morbidities such as hypertension, diabetes, cardiovascular disease, and cancer (Sun et al., 2009, Ho et al., 2010; Public Health Agency of Canada, 2009). It also exacts a collective toll with the cost of overweight and obesity in Canada estimated to be $6 billion or 4.1% of total health expenditures in 2006 (Anis et al., 2009). These costs were primarily related to the increased occurrence of 18 separate co-morbidities in obese individuals (Anis et al., 2009).

Changes in body weight, in terms of increase and redistribution of mass, are difficult to wholly attribute to perimenopause versus age (Matthews et al., 2001). Ho et al. (2010) examined changes in body composition of 438 perimenopausal women taking part in the Hong Kong Perimenopausal Women Osteoporosis Study. This 30-month longitudinal study found that after adjusting for age, age at menarche, and education level, menopausal status was a significant, independent predictor for decreased lean muscle mass, and increased percent body fat (trunk fat mass and trunk-leg fat mass ratio) (Ho et al. 2010). This study adds longitudinal data to that carried out by Lovejoy et al. (2008), and Sowers et al. (2007)

suggesting a link between the physiological changes that accompany perimenopause and weight gain during that transition.

These changes in body weight during perimenopause are thought to be linked to an energy imbalance related to biophysical changes and decreased participation in PA (Keller et al., 2010, Lovejoy, 2009, Sowers et al., 2007, and Mathews et al., 2001). In addition to a decline in PA rates, lower basal and sleeping energy expenditure, along with increased levels of follicle stimulating hormone are biological factors intrinsic to menopause that contribute to weight gain (Lovejoy, 2009 and Sowers et al., 2007). The lower basal energy expenditure is described as being a result of the elimination of the luteal phase of the menstrual cycle that accounts for approximately 100 kcal/day and loss of lean body mass (Lovejoy, 2009). Furthermore, physiological changes and their effects on weight gain during the transition to menopause are thought to be significantly amplified by a decrease in PA (Lovejoy, 2009).

The combined effect of the biological and lifestyle changes associated with perimenopause places women at greater risk for developing obesity. The implications for this are significant in terms of quality of life for women, and strain on the health resources needed to maintain and restore health in response to associated co-morbidities.

Obesity and Related Co-Morbidities

Obesity in adults is defined as a body mass index (BMI) of 30 kilograms per metre squared or greater (kg/m^2) (Statistics Canada, 2004). Adults are considered overweight if their BMI is 25.0 kg/m^2 to 29.9 kg/m^2 and underweight if their BMI is less than 20.0kg/m^2.

In 2010, an American study found that obesity has overtaken smoking in terms of burden of illness (Jia & Lubetkin, 2010). Between 1993 and 2008, the proportion of American smokers declined by 18.5%, and the proportion of obese individuals increased by 85% (Jia & Lubetkin, 2010).

Increased body weight with central mass gain is associated with higher rates of hypertension, diabetes, cardiovascular disease and cancer, an overall decrease in health and wellbeing and a decrease in longevity (Azerbad and Gonder-Frederick, 2010, Ho et al., 2010, Keller et al., 2010, Public Health Agency of Canada, 2009 & Sun et al., 2009). The Nurse's Health Study, a longitudinal study of 121 700 female nurses aged 30-55, revealed a linear inverse relationship between incremental increase in BMI, and the odds of healthy survival (Sun et al., 2009). Furthermore, every one unit increase in BMI corresponded to a 12% decrease in healthy survival past age 70, and for every 1kg of weight gained since age 18, the odds of healthy survival decreased by 5%. Finally, increased fat mass at mid-life reduces the probability of healthy survival beyond age 70 by 79% (Sun et al. 2009). The generalizability of the findings in this study are limited as the sample is predominantly Caucasian professional women with presumably great health awareness and possibly superior health practices than the general population. As well, the authors acknowledge that the term "healthy survival" is not standardized and some subjectivity was introduced in its reporting by the women. However, despite the limitations affecting the precision of the quantification of health detriment, the study validates other findings that perimenopausal obesity leads to increased morbidity in later life (Azerbad and Gonder-Frederick, 2010, and Keller et al., 2010).

A major consequence of developing obesity during perimenopause is that it compounds the risk of cardiovascular disease that accompanies this life stage for women (Keller et al., 2010), Collins et al., 2007, and Hu, 2003). Perimenopausal women have an inherent increased risk for cardiovascular disease related to depletion in the protective mechanisms of estrogen, increased testosterone levels, alterations in glucose metabolism, and higher visceral fat mass (Keller et. al., 2010, Collins et al., 2007). As well, a drop in sleep energy expenditures and increased fat oxidation during the menopausal transition are additional factors possibly contributing to the increased risk of cardiovascular disease (Keller et al., 2010). When combined with obesity and inactivity, these physiological changes acquire ominous potential for women in terms of mortality and healthy survival (Sun et al., 2009, Li et al. 2006). By following 88 393 women from 1980 – 2000 as part of the Nurses Health Study, Li et al. (2006) obesity and lack of PA are independent risk factors for the development of cardiovascular disease

The toll exacted by obesity extends to a woman's psychological and social wellbeing (Azerbad & Gonder-Frederick, 2010, Keller et al., 2010). In their review of the literature, Azerbad and Gonder-Frederick (2010) examined the full impact that obesity has on the lives of women including genetic and hormonal influences, transitions, and the social, occupational, and psychological effects. The authors describe the stigma and discrimination faced by obese women from the general public, healthcare workers, their peers, and even children. For example, compared to women who are lean, obese women were 40 to 50% more likely to experience encounter workplace discrimination at hiring, promotion,

discipline, and termination. This finding is echoed by Hansson, Naslund, and Rasmussen (2010) who found that obese women were more likely to report workplace, healthcare, and interpersonal discrimination. The study also found that gender and socioeconomic status affected patterns of discrimination with obese women of low socioeconomic status encountering more discrimination than other groups, which compounds effects noted by Azerbad and Gonder-Frederick (2010) that obese women tend to earn less than their non-obese counterparts. Hiring discrimination based on obesity is further identified by Agerstrom & Rooth (2011) building upon findings of Rooth (2007).

Obesity is associated with depression in middle aged women. In their study of 4641 women ages 40 – 65 years, Simon et al. (2008) found that rates of depression rose from 6.5% for women with BMIs under 25 to 25.9% for those with BMIs over 30 (Simon et al., 2008). These findings coincide with those of Pan et al. (2011) who followed 65 955 women aged 54 – 79 from 1996 – 2006 and confirmed a bi-directional link between obesity and depression among middle aged and older women. These studies may be limited due to the disproportional representation of Caucasian women in both samples. These phenomena are also summarized by Azerbad & Gonder-Frederick (2010) who report that obese women are 37% more likely to have experienced clinical depression, 20% more likely to experience suicidal ideation, and 23% more likely to make a suicide attempt in the last year than normal – weight women

The studies in this section demonstrate how the detrimental effects of obesity underscore the urgent need for health care professionals to address the issue. Interventions

to prevent obesity and mitigate its effects are known to include healthy diets, and PA (Evanson, Wilcox, Pettinger, Brunner, King & McTiernan, 2002; Fogelholm, & Kukkonen-Harjula, 2000; Guo, Zeller, Chumlea & Siervogel, 1999). PA can help improve quality of life and longevity for women, and mitigate some of the factors contributing to obesity among perimenopausal women (McAndrew et al., 2009; Simkin-Silverman, Wing, Boraz,& Kuller, 2003, Matthews et al., 2001; and Guo et al., 1999).

Physical activity and Weight Gain

Physical activity (PA) is consistently included in recommendations for reducing and preventing obesity across all age groups (Azerbad & Gonder-Frederick, 2010, Simkin-Silverman, 2003, Matthews et al., 2001, Evanson et al., 2002; Fogelholm, & Kukkonen-Harjula, 2000; Guo, Zeller, Chumlea & Siervogel, 1999). According to Statistics Canada (2010) being physically active is defined as expending 3.0 kcal/kg/day or more, being moderately active is defined as expending 1.5 to 2.9 kcal/kg/day, and being inactive is expending less than 1.5 kcal/kg/day. PA can help improve quality of life and longevity for women, and mitigate some of the factors contributing to obesity among perimenopausal women (McAndrew et al., 2009; Simkin-Silverman et. al., 2003, Matthews et al., 2001; and Guo et al., 1999). Canada's Guide to Physical Activity (2007) recommends 30 - 60 minutes of moderate PA per day for adults to maintain health (Public Health Agency of Canada, 2007); however none of these recommendations are specific to perimenopausal women.

There is evidence that PA, combined with comprehensive interventions that entail healthy eating, reduces and/or prevents obesity (Wu, Gao, Chen, & van Dam, 2009, Simkin-

Silverman et al., 2003, Matthews et al., 2001, Guo et al, 1999). In a meta-analysis of 18 randomized controlled trials, Wu et al. (2009) compared the effectiveness of diet-only to diet-plus-exercise on long and short term weight loss in overweight or obese adults. The findings coincide with those of Simkin-Silverman et al. (2003) whose 5 year randomized clinical trial showed that long term diet and PA interventions can prevent increases in weight and central mass during perimenopause, and with Guo et al., (1999) who found that PA can increase fat free mass and decrease total body fat in women. Interestingly, PA alone did not appear to affect weight and BMI, and this phenomenon could mask the positive effects seen with respect to fat free mass, which illustrates the limitations of BMI as the measure of obesity rather than more sophisticated measures of fat free mass (Guo et al. 1999).

Matthews and colleague's (2001) assessment of 14,148 multi-ethnic women indicated that while menopausal status, hormone use, and chronological age were predictors of BMI for middle aged women, none were as significant a predictor as PA; further supporting the need for interventions aimed at increasing PA among women in mid-life. This recommendation is echoed by Lovejoy (2009), Azerbad & Frederick (2010), and Elavsky (2009), who found that PA enhances overall quality of life for menopausal women.

Physical Activity and Women

Although physical activity has been shown to have a positive impact on health, engagement in PA declines by 30-40% during the transition to menopause (Elavsky 2009, & Evanson et al., 2002). In Canada (with comparable data for Ontario) half of females over age 20 are considered to be inactive (Statistics Canada, 2010). The Canadian Obesity

Guidelines recommend 30 minutes of moderate intensity PA three to five times per week, building to 60 minutes or more on most days, and Simkin-Silverman et al. (2003) implemented an intervention that entailed consuming 1300 kcal per day, and expending 1000 – 1500 kcal per week through PA for their sample of perimenopausal women (Lau et al., 2007).

Three studies were found that examined the factors underlying patterns of participation in PA among perimenopausal women (Im, Chee, Lim, Liu and Kim, 2008, Jeng, Yang, Chang & Tsao, 2004, and Berg & Cromwell, 2002) – see Table 1.1. Two themes transcended all three studies: health concerns and social requirements. In their qualitative study of 15 multiethnic women, Im et al. (2008) found that health concerns were both a motivating factor (i.e. women undertook PA in hopes of avoiding detrimental health outcomes) and a barrier (i.e. women described being too fatigued or ill of health to be active). In their study of 12 menopausal women, Jeng et al, found that women reported undertaking PA in hopes of delaying debilitation. Berg and Cromwell (2002) formed focus groups with 16 women, divided by ethnicity: Anglo-American (n=6) and Mexican American (n = 10), and found that while both groups viewed PA as an instrument for the preservation of health, Mexican-American women viewed PA as a method to control the onset and symptoms of disease and Anglo-American women linked health promotion, disease prevention, and psychological benefits to PA. A limitation in the applicability of this study to the present thesis is imprecise reference to the age of the women in the sample. The women in the English speaking Mexican – American group are said to be between ages 35 and 60, and the Anglo-American and Spanish speaking groups were said to be comprised of women "over 50". Companionship also emerged as an enabling factor in all three studies.

The women interviewed in all three studies discussed preferences for companionship in terms of company (Im et al., 2008, Jeng et al, 2004, and Berg & Cromwell, 2002), support (Jeng et al., 2004 and Berg & Cromwell, 2002), and safety (Im et al., 2008). Other themes to arise are listed in Table 1.1. Each study poses limitations in terms of generalizability. Berg and Cromwell (2002) achieve purposeful ethnic variation in their comparison of Anglo-American and Mexican – American women, and Jeng et al. (2004), while a homogeneous sample (Taiwanese women), provides contrast to the homogeneous Caucasian bias cited by Im et al. (2008), findings can only be extended beyond these three ethnic groups with caution. Also, socioeconomic status is not provided in 2 studies (Jeng et al., 2004 and Berg & Cromwell, 2002) and is biased in favour of higher status within Im et al., (2008). These studies examined the factors described by individual women as affecting their participation in PA. However, the socioenvironmental context within which women make lifestyle decisions (i.e. whether or not to be active) bears exploration as well.

Table 1.1 - Key studies Related to Women's Experiences with Physical Activity

Themes Identified in Studies	Jeng et al. (2004) N = 12	Im et al. (2008) N=15	Berg & Cromwell (2002) N=16
Perceived benefits to physical/psychological health	X – "Perceived continuous power"		X
Participation in PA is associated with exercise self-efficacy	X		
Lack of Time/Managing Responsibilities		X	X
Gendered Experience		X (Exercise viewed as "masculine")	
"Physical Activity" as all body movements		X	
Environmental issues	X	X	
Health Concerns	X – enabling factor	X – Enabling factor	X – Enabling factor and barrier
Social requirements	X - Companionship	X – Need for companion	X – group cohesion

X = theme identified within the study

Socioeconomic characteristics and influence on PA.

It is well established that biologic/genetic factors interact with environmental factors to produce individual adaptations that may or may not result in the development of obesity (Harrington & Elliott, 2009). More specifically, education, income, housing, employment, physical environment, and coping skills are known to affect health and lifestyle decisions, and are encompassed by the term: Social Determinants of Health (Raphael, 2002). For example, McLaren (2007) found that women of lower socio-economic status have higher incidence of weight gain.

The impact of neighbourhood design on health is examined in two studies. Features contributing to healthy eating and physical activity (i.e. availability of fresh produce and well-lit, safe streets), are contrasted with features referred to as "obesogenic" (i.e. few sidewalks, preponderance of fast food restaurants) (Keller et al. 2010, Harrington & Elliott, 2009). In their 2009 study, Harrington and Elliott point to 'average dwelling values' as a reliable indicator of individual socioeconomic status as compared to collective wealth, and findings that, among women, those values are linked to both BMI and waist circumference measures. The authors discuss female perception of neighbourhood satisfaction, arguing that lower satisfaction is linked to lower self rated health, PA, and obesity, and that women rely more heavily on neighbourhood resources for PA and healthy eating (Harrington & Elliott, 2009).

Conclusion

In summary, there is agreement that women transitioning to menopause experience central fat mass gain and increased risk of obesity. There are many factors influencing weight gain in perimenopausal women such as physiological changes, socio-economic characteristics, attitudes about PA and neighbourhood characteristics. Although PA is an important intervention in preventing or mediating the effects of obesity including associated co-morbidities, participation rates in PA decline for perimenopausal women. However, there is a dearth of information explaining how perimenopausal women perceive their experiences around PA, and how this perception influences the decision to undertake PA and the motivation to follow through on that decision. Gaining an understanding of this perception is critical for designing interventions to enhance PA.

Theoretical Basis

In keeping with the comprehensive nature of nursing philosophy, the current thesis was approached from a holistic perspective exemplified by the World Health Organization definition of health: "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (WHO, 1948). Therefore, the physiological factors (i.e. menopausal symptoms), psychological components of decision-making (i.e. attitudes), and social context (i.e. socioeconomic status) were considered in the design and analysis of findings.

Further to the holistic nursing approach, the Midlife Women's Attitudes toward Physical Activity (MAPA) theory was chosen as the theoretical basis for the physical

activity study (Im, Stuifbergen & Walker, 2010). This framework was developed based on findings from a single qualitative study by nurses. There are six key concepts in the framework: gendered experience (meaning the way physical activity was promoted among boys and not girls during childhood), physical activity across all body movements (the belief that so long as one is "moving" as opposed to sitting still, they are active), lack of time for PA, environment matters (i.e. climate), health concerns (both as an enabling and inhibiting factor), and the need for a companion. Im et al. (2010) suggest that when addressing PA in the clinical setting nurses consider the multiple roles assumed by women, cultural factors, and the physical environment in which the woman lives. The theory was chosen due to the comprehensiveness with which it frames the issue of PA in the context of women's lives, and because to the best knowledge of the author, it is the only conceptual framework specific to this population. The strengths of the framework are that is was focused on perimenopausal women and physical activity and adopted a socioenvironmental approach. However it is limited by the fact that it has not been tested beyond the conceptualization in this single qualitative study. It was anticipated that sociocultural, psychological, and environmental factors would emerge from the present primary study, and therefore a theory that was able to accommodate multiple aspects of a woman's life was sought. As well, the theory is emerging, with the authors identifying that several concepts within (i.e. context of daily lives) require further exploration. It is thought that this thesis has potential to contribute to informing the concepts and relational statements in the MAPA theory.

Personal perspectives of the primary researcher

By working in health promotion at a community level, I gained awareness of the urgency and complex nature of the problem of obesity. I was part of local, regional, and provincial collaborations aimed at coordinating the resources of many agencies all working toward the same goal – a reduction in obesity rates and associated co-morbidities. This work served to broaden my perspective so that I now view obesity as a result of an intersection of attitudes, resources, and decisions on an individual level, and as a personal response to structures established and maintained by the collective. I also come from a background in mental health nursing, where assessment of and appreciation for the many factors that affect personal choice and behaviour are forefront in practice. As part of my graduate studies, I was inspired to conduct my own study. My hope is that the knowledge contained within the present thesis will help fill an identified knowledge gap with respect to PA and perimenopausal women, thereby improving the approach of practitioners toward this population and perhaps enhancing quality of life.

General Thesis Organization

This thesis is presented in two papers comprising Chapters 2 and 3. The paper in Chapter 2 is a descriptive study of an environmental scan to determine the status of evidence-based information available and applicable to perimenopausal women with respect to body weight changes. The two specific research questions guiding the environmental scan were:

a) What is the current knowledge for perimenopausal women related to body weight/obesity, physical activity, and nutrition available on the Internet by health organizations/agencies?
b) What is the quality of the evidence underlying information presented on these websites?

The second paper, in Chapter 3, presents the qualitative exploration of the barriers and enabling factors to physical activity in perimenopausal women. The specific research questions guiding the inquiry are:

a) What enables peri-menopausal women to initiate physical activity?
b) What interferes with peri-menopausal women engaging in physical activity?
c) How can health professionals facilitate increase physical activity among perimenopausal women?

The fourth chapter provides a global discussion that integrates the findings from both papers and discussing their implications for nursing practice, education, and research. Chapter 5 summarizes the contributions of collaborators.

Chapter 2

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Evidence on body weight changes for perimenopausal women: An environmental scan of publically accessible resources

Deanne McArthur BScN, RN, Sarah Mullan MSc, Dawn Stacey, RN, PhD, CON (C)
University of Ottawa

Deanne McArthur, BScN, RN, is a Master's student in the MScN/PHCNP program at the University of Ottawa. Sarah Mullan, MSc, is a research assistant with the Ottawa Hospital Research Institute. Dawn Stacey, RN, PhD, CON (C), is an Associate Professor with the School of Nursing at the University of Ottawa and Scientist at the Ottawa Hospital Research Institute.

Author Contact Information:
Deanne McArthur
University of Ottawa

Abstract

Objective: to explore the status of evidence-based information pertaining to body weight changes during the transition to menopause available online for Ontario women.

Methods: an environmental scan of online resources for Ontario women was undertaken to assess the availability of evidence-based information pertaining to body weight changes during the transition to menopause. A snowball approach was used starting with all 36 health units in Ontario and branching to external sites referenced by the initial resources. The websites were evaluated using the Clinical Usefulness of Evidence-Based Websites (CLUE W), and subjected to descriptive analysis.

Results: of the 52 resources searched, 6 (11.5%) contained information specific to perimenopausal women but primarily referred to information that was general in nature. Only the Canadian Obesity Network provided information related to the increased risk for developing obesity during the menopausal transition, the health risks associated with that weight gain, and role of physical activity in mitigating risks for and effects of obesity. The websites scored on average 49 out of 100 (range 39.2 to 58.8) on the CLUE W tool.

Conclusions: there is a lack of evidence-based information regarding body weight changes available for perimenopausal women.

Background

Perimenopause represents a time of significant physiological change for women. Decreased estrogen causes women to experience a broad range of symptoms including sleep disruption, hot flashes, joint pain and skin and eye changes (Society of Obstetricians and Gynaecologists of Canada, 2006). Concurrently, women are also at an increased risk for weight gain and the development of obesity, typically gaining between 2.25 and 4.5 kg with 20% of women gaining more (Ho, Wu, Chan & Sham, 2010; Lovejoy, Chamgagne, de Jonge, Xie & Smith, 2008; 2009; Keller et al., 2010; Sowers et al., 2007). Of concern is the association of obesity with several co-morbidities such as hypertension, diabetes, cardiovascular disease and some types of cancer (Ho et al., 2010, Sun et al., 2009, Public Health Agency of Canada, 2009). Women also experience an increased risk of cardiovascular disease related to lower estrogen levels, increased testosterone, changes in glucose metabolism, increased fat oxidization and accumulation of visceral fat mass – a risk that is further exacerbated by weight gain (Keller et al., 2010, Hu, 2003).

Obesity also affects women's psychosocial health with obese women more likely to be of lower socioeconomic status and to experience workplace discrimination than their non-obese counterparts (Azerbad & Gonder-Frederick, 2010, Keller et al., 2010). In terms of mental health, obese women are more likely to have experienced clinical depression (37%), and suicidal ideation (23%) and attempt (23%) in the last year than lean women (Azerbad & Gonder-Frederick, 2010). Despite the increase in risk for weight gain and associated co-morbidities, little is known about the public health messages targeting women about body weight changes during perimenopause.

Women are increasingly turning to the internet to inform themselves about matters pertaining to their health. According to the Pew Internet and American Life Project (Fallows, 2005), 86% of online women will consult the internet for health information. Another study found that seeking health information (57%) was the third most popular internet activity among Canadians after email (93%) and browsing (90%) (Crowley, 2002). The purpose of this study was to explore the status of evidence-based information pertaining to prevention of weight gain and obesity during menopause available online for Ontario women. The specific research questions were: what is the current information for perimenopausal women related to body weight/obesity, physical activity, and nutrition available on the Internet by health organizations/agencies? What is the quality of the evidence underlying information presented on these websites?

Methods

An environmental scan was conducted in November 2009 and updated in June 2011 to ascertain the presence and content for perimenopausal women on websites for health care organizations and agencies in Ontario. Included were all websites provided by public health units and associated health organizations. Excluded were commercial lifestyle sites (i.e. weight loss programs).

A snowball approach was used in the selection of web-based resources for evaluation. The search began with an assessment of the websites provided by all 36 Health Units in Ontario (see table 1). Expansion of the search was carried out by following sources

linked by those included and resulted in an additional 16 Canadian health agencies (see table 2).

Sites with a "search" function were searched using keywords: "menopause", "healthy weights", and "obesity". "Healthy weights" and "obesity" were first searched combined with "menopause". The terms were then separated out to ensure no documents were missed by narrowing the search criteria. If the site did not provide a search function, relevant categories within the site were investigated (i.e. "women's health", "healthy eating", "lifestyle", etc.) for documents pertaining to body weight changes during menopause. Discontinuation of the search for information on the site took place when links and citations achieved redundancy.

The websites located in the search were independently appraised for quality by the primary researcher (DM) and a research assistant (SM) using the Clinical Usefulness of Evidence-Based Websites (CLUE W) tool (Labrecque, 2007). Website appraisal findings for the two independent evaluators were compared and sites for which there was disagreement were revisited and discussed until consensus was reached on all scores. Scores were entered into an Excel spreadsheet and subjected to descriptive analysis.

CLUE W was found to have excellent inter and intra-observer measurement reliability (Frémont, Labrecque, Légaré, Baillargeon & Misson, 2001). The tool guides assessment of websites based on the following criteria: validity (transparency, timeliness, selection and assessment of information), relevance (purpose, target audience, clinical) and work (hyperlinks, ease of use, practicality, access fees and ease of evaluation). Points are

awarded based on the presence and quality of each category, with a final mathematical application (0.4*V + 0.35*R + 0.25 * [100-W]) generating an overall score out of 100.

Results

Of 36 health units in Ontario, 2 (6%) provided information about body weight, exercise, and/or nutrition specific to perimenopausal women (see Table 3). Four of the 17 (23.5%) health agencies in Canada also provided this information. For the 6 websites identified, CLUE W scores ranged from 39.2 – 58.8 out of 100 (average 49).

Body Weight Changes

Of the 6 websites, 5 (83.3%) make reference to body weight changes commonly occurring during the transition to menopause (see Table 3). The Canadian Obesity Network provides information with respect to postmenopausal weight gain, and the associated co-morbidities for which women are at an increased risk citing a single study (Dennis, 2007). Lambton County Health Unit briefly mentions weight gain during perimenopause attributable to the body's metabolism "slowing over time" due to a reduction in muscle mass however, it does not provide women with an understanding of the causality of the loss of muscle mass or how much weight is typically gained during perimenopause. The Society of Obstetricians and Gynaecologists of Canada provide the typical range of weight gain (5 – 9 lbs), but do not explore the physiology underlying the gain (Lovejoy, 2009). Although no evidence-based sources are provided, both of these sites (LCHU & SOGC) provide information that is consistent with the literature (Keller, 2010, Lovejoy, 2009, Sowers et al., 2007 & Matthews et al., 2001).

Eat Right Ontario and the North American Menopause Society respectively contradict research that finds the menopausal transition to be an independent factor contributing to weight gain. For example, Eat Right Ontario states: "weight gain is part of the natural aging process... it is not usually caused by menopause".

Nutrition

General nutrition information was provided by all 6 websites, with 2 (33%) linking to Canada's Food Guide (Health Canada, 2007 & 2010). All of the sites discuss nutrition as part of an overall plan to achieve health, while 2 sites (33%) specifically discuss diet relative to weight control. The Canadian Obesity Network links to original research findings supporting the role of Calcium and Vitamin D in achieving and maintaining a healthy weight (Caan et al., 2007). Eat Right Ontario suggests a reduction in portion sizes as a weight loss strategy. Lambton County Health Unit and Eat Right Ontario discuss nutrition (i.e. consuming essential fatty acids) as a strategy to reduce menopausal symptoms.

Physical Activity

Five (83.3%) sites referred to physical activity as part of a healthy lifestyle overall. Three (50%) of the sites cite exercise as promoting bone health, and 2 sites (33%) posit that physical activity helps control menopausal symptoms. One site linked to Health Canada's Physical Activity Guides (CSEP, 2011). Canadian Obesity Network and Society of Obstetricians and Gynaecologists of Canada both discuss physical activity as part of a weight management strategy. The information provided is unreferenced, and none of the sites provide details about the physical activity required for perimenopausal women.

Other Information

Other information resources associated with menopause covered topics including: osteoporosis, cancer risk and screening, sexual health, symptom control (i.e. hot flashes), and hormone replacement therapy. For example, Haldimand-Norfolk Health Unit pamphlet encourages women to view the transition as positive and to take healthy measures to adapt to the challenges associated with this life stage (i.e. connecting with friends, seeking appropriate medical advice etc.).

Discussion

Principal Findings

There is a dearth of information accessible to Ontario women pertaining to body weight changes during perimenopause. The information available from trusted sources tends to be general in nature (i.e. referring to Canada's Food Guide) and does not address the unique needs of perimenopausal women. Furthermore, appraisal of the information on these websites scored weak to moderate on the CLUE-W tool, with only the Canadian Obesity network referencing evidence-based sources. As well, information was provided suggesting that body weight change is weakly or not at all linked to perimenopause (Eat Right Ontario, 2011 & North American Menopause Society, 2010). From these statements, and from the overall lack of emphasis, women might be left with the impression that weight gain is "natural" and at the same time, is not a health issue bearing additional concern during perimenopause. Nutrition was discussed in general terms related to overall wellbeing, but without specific recommendations related to body weight (Simkin-Silverman, 2003).

It is also noted that none of the sites are interactive in nature. Each of the sites was focused toward the provision of information, and did not provide opportunity for users to co-create experiences, to interact with others, or to tailor the site to their needs.

Strengths and Limitations

The strengths of this study lie in the comprehensive approach undertaken to review the websites and the assessment and appraisal of the websites by two independent researchers. Subsequent discussions leading to consensus on findings ensured that the merits of each site were evaluated critically, and from two perspectives: a public health nurse (DM) and a research assistant with a Masters of Science in Public Health (SM). The familiarity with the resources sought, provided a beneficial starting point from which to launch the search.

The limitations of this environmental scan largely pertain to the fluid nature of the internet. For example, two website resources observed by the one researcher were no longer accessible for review by the other person within weeks of the original search. Secondly, it is possible that our search process may have missed some relevant online resources and our search did not include all health organization websites. Obesity prevention resources, pertaining to perimenopause, could have been ‘hidden’ within other documents not revealed by the use of our keywords, and the searches undertaken were not always reproducible. Third, the CLUE-W tool was limited in its applicability to our purposes. While it provided a thorough assessment guide for the validity of website resources, it appeared to be created with the intent of appraising those sources accessed by health care professionals rather than

patient or public-focused health information. The sites assessed in the present study were generated with the public at large as the target audience, and likely tailored the level of literacy, and consequently validity indices of that population. It is therefore possible that the CLUE-W scores achieved by the five sites with information pertaining to perimenopausal women are not indicative of their relevance and/or strength of content as it relates to the users in question – perimenopausal women.

Conclusions

There are few resources available for perimenopausal women with respect to weight gain during the transition to menopause and evidence-based interventions to mitigate that risk. Most of the resources available provide general information regarding perimenopausal physiology and symptom management, with links to generic nutritional recommendations (i.e. Canada's Food Guide). While these resources are valuable, they do not address the unique needs of women transitioning through this life stage. The resources that women can access were found to lack transparency on the underlying evidence. Despite that websites are easily accessible, to date they are underused as a route for translating evidence to inform perimenopausal women of interventions to manage body weight changes during the transition to menopause.

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Table 2.1: Included websites for Ontario health units

Health Units Evaluated		
Algoma P.H Brant County H.U Chatham – Kent P.H Durham Region H.D Eastern Ontario H.U Elgin-St. Thomas P.H Grey Bruce H.U Haldimand-Norfolk H.U Kawartha Pine Ridge D.H.U Halton Region H.D City of Hamilton P.H.S Hastings/Prince Edward Counties H.U	Huron County H.U Kinston Frontenac Lennox Addington H.U County of Lambton Leeds Grenville and Lanark D.H.U Middlesex-London H.U Niagara Region P.H.D North Bay Parry Sound D.H.U Northwestern H.U Ottawa P.H Oxford County P.H Peel P.H Perth D.H.U	Peterborough County-City H.U Porcupine H.U Renfrew County D.H.U Simcoe Muskoka D.H.U Sudbury and District H.U Thunder Bay D.H.U Timiskaming H.U Toronto P.H Region of Waterloo P.H Wellington-Dufferin-Guelph P.H Windsor-Essex County H.U York Region P.H.S

Table 2.2: Included websites for health care organizations and agencies

Health Agencies Evaluated	
Calorie Control Council Canadian Diabetes Association Canadian Obesity Network Canadian Women's Health Network Centre for Health Promotion Centre for Obesity Research and Education (CORE) Dietitians of Canada Eat Right Ontario	Health Canada Healthy Measures Heart and Stroke Foundation The Health Communication Unit North American Menopause Society Public Health Agency Canada Society of Obstetricians and Gynaecologists of Canada Women's Health Matters Menopause Canada

Note: P.H = Public Health, H.U = Health Unit, D.H.U = District Health Unit, P.H.S = Public Health Services

Table 2.3 – Information provided by websites addressing perimenopausal weight gain

Information Provided				
Organization	**CLUE W Score**	**Weight**	**Nutrition**	**Exercise**
Canadian Obesity Network	Validity = 47/100 Relevance = 50/100 Work = 10/100 *Total = 58.8/100	Discusses increased risk for weight gain/obesity postmenopause and associated co-morbidities.	Calcium and Vitamin D as factors in weight control.	Promotes physical activity for symptom and weight control.
Society of Obstetricians and Gynaecologists of Canada	Validity = 40/100 Relevance = 50/100 Work = 14/100 *Total = 55/100	States women typically gain between 5 – 9 lbs during perimenopause.	Link to Canada's Food Guide. Link to "My Food Guide – healthy eating tool customized to age and sex".	Promoted for weight management and building bone and muscle. 30 – 60 minutes of physical activity most days. Endurance, flexibility, strength and balance.
Haldimand-Norfolk Health Unit	Validity = 43/100 Relevance = 50/100 Work = 10/100 *Total = 54.1/100	None.	Link to Canada's Food Guide.	Promoted for bone density and symptom control. Link to Canada's Physical Activity Guide.
Eat Right Ontario	Validity = 29/100 Relevance = 50/100 Work = 20/100 *Total = 49.1	States that weight gain is "part of the natural aging process".	Promotes eating "less food"(link to fact sheet about portion sizes). Increase intake of fruits, vegetables, whole grains, soy, lentils, lean meat, low fat dairy, calcium and Vitamin D. Reduce saturated fats.	30 – 60 minutes of physical activity most days of the week.
Lambton County Health Unit	Validity = 13/100 Relevance = 50/100 Work = 34/100 *Total = 46.7/100	Reduction in metabolism leads to risk for weight gain. Recommendations to adopt a "healthy eating style" and "stay active".	Reduce fat intake. Increase fruit and vegetable, calcium, legumes iron-rich foods. Limit alcohol and caffeine.	Aerobic activity (brisk walking), and strength training are recommended to build up bones and muscles.
North American Menopause Society	Validity = 21/100 Relevance = 50/100 Work = 58/100 *Total = 36.4	States that evidence suggesting link between perimenopause and weight gain is "mixed".	Consume "real" food. Portion control. Vitamin D, calcium and fish oil.	Promotes resistance training to build muscle.

*In order to compare across websites, sub scales were standardized out of 100 (0 = poor, 100 = excellent).

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Chapter 3

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Understanding factors that enable and discourage physical activity in women experiencing perimenopausal transition: A qualitative study

Deanne McArthur, BScN, RN, Alexandre Dumas, PhD, Kirsten Woodend, PhD, Sarah Mullan MSc, Dawn Stacey, RN, PhD, CON (C)
University of Ottawa

Deanne McArthur BScN, RN is a Master's student in the MScN/PHCNP program at the University of Ottawa. Alexandre Dumas, PhD, is an Associate Professor with the School of Human Kinetics at the University of Ottawa, Kirsten Woodend, PhD, is the Dean, Trent/Fleming School of Nursing at Trent University, Sarah Mullan, MSc, is a research assistant with the Ottawa Hospital Research Institute, and Dawn Stacey, RN, PhD, CON (C), is an Associate Professor with the School of Nursing at the University of Ottawa and Scientist at the Ottawa Hospital Research Institute.

Author Contact Information:
Deanne McArthur
University of Ottawa

Abstract

Background: Women transitioning through menopause are at increased risk of weight gain and obesity. Although physical activity helps prevent weight gain and mitigate the effects of obesity, physical activity rates among perimenopausal women are low.

Objective: To explore the factors that enable and discourage physical activity among perimenopausal women.

Methods: A qualitative study using Interpretive Description design of women age 40 to 60. Women were asked to describe an experience in which they planned to undertake physical activity and succeeded and another experience in which they did not succeed. Inductive content analysis was conducted independently by two individuals with constant comparative analysis across interviews.

Results: Twenty-six women aged 40 to 59 years were interviewed. The six broad themes affecting physical activity emerged as: routine, intrinsic motivation, psychosocial elements, environmental factors, biophysical issues, and resources. The most cited enabling factors (sub themes) were: an established daily structure that incorporated physical activity (routine), anticipated positive feelings associated with PA (intrinsic), and accountability to others (psychosocial). The three most prevalent barriers were disruptions in daily structure (routine), competing demands (routine) and self - sacrifice (psychosocial).

Conclusions: Perimenopausal women describe the barriers to their PA during perimenopause as being attributable to the demands of this life stage and not to the physiological experience of menopause. Common barriers and enabling factors should be accounted for in the design of interventions aimed at increasing PA among perimenopausal women.

Introduction

Women transitioning into menopause experience a number of physiological changes that may affect health and quality of life (Soules et. al., 2001, Lovejoy, 2009). Among these changes are cessation of menses, skin changes, sleep disruptions, reductions in basal metabolic rate, and loss of lean muscle (Lovejoy, 2009). This life stage also coincides with a reduction in physical activity but up to 30% - 40% (Elavsky 2009, Evanson et al., 2002). The combined effect of these changes is that the risk for weight gain and subsequent development of obesity increases for perimenopausal women with approximately 30% of women experiencing obesity during this life stage (Ho, Wu, Chan & Sham, 2010). Of concern is that obesity also places women at risk for associated co-morbidities such as diabetes, hypertension, cardiovascular disease, and some cancers (Public Health Agency of Canada, 2009).

Physical activity (PA) is often prescribed as part of a strategy aimed at maintaining a healthy weight and preventing obesity by increasing fat free and lean muscle mass, and decreasing total body fat (McAndrew et al., 2009, Evanson et al., 2002, Matthews et al., 2001, Soules et. al., 2001, Fogelholm, & Kukkonen-Harjula, 2000, & Guo, Zeller, Chumlea & Siervogel, 1999). According to the World Health Organization (2010), women between the ages of 18 and 64 should strive to achieve 150 - 300 minutes of moderate to vigorous PA per week, however these recommendations are not specific to perimenopausal women. Simkin-Silverman, Wing,, Boraz & Kuller (2003) found that PA, combined with healthy diets, can prevent weight gain and increased waist circumference during perimenopause. Specifically, perimenopausal women in the study were told to expend 1000 – 1500

kcal/week with PA and consume 1300 kcal/day with a healthy diet (Simkin-Silverman et al., 2003). Unfortunately, despite the health benefits of engaging in PA, perimenopause represents a life stage wherein participation rates for women decline by up to 40% (Evanson et al., 2002; Statistics Canada, 2010). Understanding the causes of this decline is important given the risks posed to women's health, and the mitigating effect attributed to PA.

The Midlife Women's Attitudes Toward Physical Activity (MAPA) theory (Im, Stuifbergen & Walker 2010) is an emerging theory for future research intended toward revealing the perceptions of perimenopausal women related to PA. The MAPA theory "aims to explain the relationship of midlife women's attitudes toward physical activity to their actual participation in physical activity, while also considering other influencing factors that are known from the literature" (Im et al., 2010 p. 52). The theory has eight major concepts - women's attitudes toward PA, women's participation in physical activity, background characteristics, health and menopausal status, physical activity self-efficacy, social influence, barriers to PA, and contexts of women's daily lives. The holistic approach promoted by the theory is in keeping with addressing the complexity of women's decisions pertaining to their lifestyles – in this case, their PA. The factors that ultimately determine whether or not a woman undertakes PA represent a confluence of internal and external realities within her life, along with her emotional and behavioural response. The findings of the present study are examined in light of the concepts and their relationship as presented in the MAPA theory.

In summary, the perimenopausal life stage for women represents a time of increased risk for weight gain and a time during which they are less likely to participate in physical activity; both of which impact negatively on their overall health. While we have some knowledge as to the benefits women ascribe to being active and the factors contributing to the attitudes they hold toward PA, little is known about the factors that enable and/or hinder their participation.

The purpose of this study was to explore barriers and enabling factors to participation in PA among perimenopausal women. The specific research questions guiding the inquiry were:

a) What enables peri-menopausal women to initiate physical activity?

b) What interferes with peri-menopausal women engaging in physical activity?

c) How can health professionals facilitate increase physical activity among perimenopausal women?

This study took place within the larger team grant titled "Sherbrooke-Ottawa-Montréal Emerging Team (SOMET) on Critical Periods of Body Weight Regulation: A Women's Health Perspective". One of the objectives of the SOMET grant that is focused on knowledge translation to perimenopausal women is to determine individual and environmental factors influencing perimenopausal women implementing decisions for achieving and maintaining healthy body weight during the transition to menopause. To achieve this objective, a mixed methods study was conducted using semi-structured interviews of 60 women aged 40 – 65 recruited from the Ottawa area. Women were

recruited using posters in communities (e.g. bulletin boards in grocery stores, community centres, exercise facilities) and using online requests for volunteers on Kijiji and Used Ottawa. To be eligible, the women had to live in the Ottawa region and be able to answer questions in English. The present study is a sub-analysis of the qualitative data, focused on women's experiences with PA, that was collected within this sub-study of SOMET.

Methods

Study Design

A qualitative study using Interpretive Description design was conducted to explore perimenopausal women's perceptions of the barriers and enabling factors influencing their participation in PA. A qualitative approach was chosen to provide a deeper understanding of women's experiences with PA. Interpretive description is primarily an inductive approach that requires the researcher to take 'ownership' of the themes revealed by the data, as opposed to adhering tightly to a pre-determined theoretical framework (Thorne, 2007 & Thorne, Kirkham & O'Flynn-Magee, 2004). Furthermore, the expected outcomes of studies guided by interpretive description are clinical applications for use by clinicians in informing assessment, planning, and interventions. Overall, interpretive description was chosen as structural support for the inductive approach of the present study due to its alignment toward the generation of clinically-relevant knowledge, and its construction as an 'evolving' theory with room for amendments following subject responses.

Participants

Participants were selected for this sub-study from the larger SOMET study database. Eligible participants were women from 40 to 60 years of age who were able to answer questions in English. Women were purposively selected to achieve variation in perimenopausal stage and symptoms (e.g. mild to severe), and neighbourhood socio-economic status (SES) (e.g. low, middle, or high). The unifying feature of the sample was the women were within the age range for perimenopause (42 – 58 years); however, heterogeneity was sought with respect to menopausal experience and socioeconomic factors in order to obtain a range of experiences with PA and enhance transferability of the findings (Soules et al., 2001, Lincoln & Guba, 1985).

Interviews were purposefully selected from the larger SOMET dataset until data saturation was achieved. An additional three women were then added to confirm saturation (Francis et al., 2009). No new enabling factors were cited by women past the eighth interview and no new barriers were provided beyond the tenth interview. Given that the present study was nested within the larger SOMET study, which had generated a dataset with qualitative responses from 30 participants at the time of this study, it was decided to challenge the "ten plus three" saturation approach described by Francis et al. (2009). The sampling procedure was repeated with another set of 13 interviews. No new themes emerged from within the second set of 13. Altogether, 26 interviews were analyzed with saturation having occurred after the initial ten, thus reinforcing the validity, in the context of the present study, of the saturation approach described by Francis et al. (2009).

Data Collection

Women, in the larger SOMET study, were interviewed, after signing a consent form approved by the University of Ottawa Research Ethics Board. Interviews took place at a convenient location and time, using a structured interview guide. The interview guide was based on the Population Needs Assessment Tool, which was developed using the Ottawa Decision-making Framework (Jacobsen & O'Connor, 2006). The study questions were pilot tested with five participants for feasibility and comprehension. Feedback was obtained and incorporated into the final version of the interview guide. Participant interviews were audio-recorded and notes captured on the interview guide. For the purposes of this study, responses retrieved from the larger data set pertain to the following questions:

- Think about a time when you incorporated physical activity into your day. Tell me about your initial thoughts of exercising on that particular day all the way through to the actual undertaking of physical activity.
- Now think of a time you planned to incorporate physical activity into your day, but for some reason or another you were unable to. Tell me about your initial thoughts of being physically active on that particular day all the way through to the actual point when you were unable to undertake physical activity.

Demographic information, obtained from the larger sample, included perceived severity of menopausal symptoms, age, education level, the socioeconomic measurement of the women's home neighbourhood, household income, and financial perception (comfortable, insufficient etc). Women were asked to rate their menopausal symptoms, related to psychological, somatic, and urogenital, on scales from 0 - 5 Using the Menopausal

Rating Scale (Hinemann, Potthoff & Schneider, 2003). Higher total scores were indicative of greater severity of symptoms (0 = no symptoms; 55 = severe symptoms). The Ottawa Neighbourhood Study (2009) divided the Ottawa Area into 92 discreet neighbourhoods and created a profile for each that included: demographics, housing, greenspace, education and culture, health outcomes, and SES. Neighbourhoods were defined as high, middle, and low socioeconomic status (SES) according to the Ottawa Neighbourhood Study (2009). Socioeconomic status is compiled using a formula that factors average income, percent below the Low Income Cut Off, the unemployment rate, percentage of citizens with less than high school education and those headed by a lone parent. The resulting scores were divided into quintiles and representation from each was sought in the purposive sample (Ottawa Neighbourhood Study, 2009). Information contained within the Ottawa Neighbourhood Study was based on municipal and federal data sources.

Data Analysis

Demographic data was entered into an Excel database and analyzed descriptively. Digital recordings of the interviews were first edited to include only the responses to the qualitative questions used for this study. The edited audio files were transcribed verbatim. In keeping with the principles of Interpretive Description, each transcript was read in its entirety while listening to the audio-recording to determine themes and patterns that emerge inductively from an "aerial view" of the data. As Thorne (2004) notes, connotations, and meanings apparent in audio recordings can be masked within written transcriptions, and so both media were included in analysis. Analysis was conducted independently by the primary researcher (DM) and a research assistant (SM) and involved the following steps:

listening to audio recordings while reading written transcriptions to ensure accuracy of the transcripts, analyzing each response line by line for barriers and enabling factors affecting perimenopausal women's participation in PA, and performing comparative analysis on subsequent transcripts with findings building upon those themes and patterns that had previously emerged. Themes were identified and tracked using an Excel database and consensus was reached on all themes. A third researcher (DS) participated in the first two consensus meetings and as needed for subsequent meetings. Findings were audited by the research team to ensure themes were consistent with supporting quotes. Consistent with the Interpretive Description approach, themes were first subject to broad inclusion so as not to restrict the validity of the data due to premature categorization. As further interviews were analyzed, responses were grouped first into various sub themes, with those eventually being clustered under applicable broad themes.

Results

Participant Characteristics

Twenty-six women participated in the study between June 2010 and February 2011 with an age range of 41 – 58 (median = 50.5 years) (see Table 1). Purposive sampling was achieved by the inclusion of women from low (n=3), middle (n=16), and high socioeconomic status neighbourhoods (n=7), and menopausal symptoms ranging from mild to moderate (n=23) and moderate to severe (n=3). Participants described their financial status as "comfortable" (n=15) or "sufficient" (n=8). Women's education ranged from secondary school only up to completion of post secondary (see Table 3.1).

Summary of Broad Themes

Six broad themes were revealed in the analysis that women perceived as enabling factors or barriers their participation in PA: routine, intrinsic motivation, psychosocial elements, environment, biophysical issues, resources (Figure 1). Sub themes, within each of the broader themes, could be bi-directional (i.e. both facilitators and barriers) or uni-directional (i.e. barrier only).

Routine

Routine refers to the organization of the women's lives and the extent to which PA is emphasized or permitted within that organization. All 26 women cited one or more subthemes within the broad theme routine. Within this broad theme were four sub themes: PA incorporated into daily structure, other demands, preparedness, and prioritization of PA. PA incorporated into daily structure, is a bi-directional sub theme and defined as women's ability and inclination to assemble their daily lives in such as way as to organize their day or week with scheduled PA. If the women perceived a high degree of amenability to including PA within the structure of their daily lives, this was seen as a strong enabling factor: : *"...it was Monday, Wednesday, Saturday...those were the days that we already planned and we would go at a specific time" (#4-1).* Conversely, the interruption of this structure was viewed as a barrier: *"...I didn't do it [PA] yesterday because I had an appointment early"(#8 – 1).* Another sub theme, other demands, was uni-directional and the most significant barrier reported overall by the women. Incorporating PA among many other competing interests or responsibilities was the most challenging barrier facing women in their attempts to uphold their intentions to be physically active: *"...the bike ride got pushed over because I had to*

madly clean the house..." (#1 - 1) Preparedness emerged as the third sub theme within routine. This sub theme is bi-directional, and refers to the efforts made by the women to have the necessary equipment (i.e. gym clothes) and arrangements in place ahead of time was viewed as an important enabling factor, while being unprepared was viewed as a significant barrier: *"... I made sure I had all my gym stuff with me when I went to work, and that's something where I've forgotten it, I go:well, I can't go anyways" (#20 - 1).* The final sub theme within routine was priority. This sub theme is a uni-directional enabling factor which referred to the women's identifying that the emphasis they placed on PA relative to other aspects of their daily lives resulted in being a facilitator or barrier: *"...work gets in the way...and I feel lousy when I didn't...get the exercise in. But I know, because I'm committed, that I'll go the following day" (#25 – 2).*

Intrinsic Motivation

Intrinsic motivation, the second broad theme refers to those factors that were initiated from within that either enabled or were barriers to engaging in PA. Intrinsic motivation had six sub themes: anticipated good feelings, perceived health benefits, self sabotage, negative/ambivalent mood, meaningful PA and poor experience. Anticipated good feelings a uni-directional enabling factor, included physiological sensations (i.e. a "rush" during and/or following exercise), or emotional (i.e. a feeling of accomplishment): *"...I know the end result is always a good feeling"(#4 - 1).* Another enabling factor, perceived health benefits, pertains to the motivation attached to the women's perception that PA contributed to either their overall health or certain aspects of it. For example, one woman said: *"I find it [PA] really relieves stress...I sleep so much better...it's a real stress release for me"(#30 –*

2). The third sub theme was self sabotage. This barrier was evident when women described putting obstacles in their own way to avoid PA, even though they set out to be active. They seemed to be describing instances when their true position was ambivalence, but they felt they "should exercise", and were seeking justifications to allow their feelings of: "I don't feel like it" to override their feelings of: "I should". A quote illustrating an example of this is found in Box 1.

Box 1: Example of Self Sabotage as a barrier to PA.

"I'll go do groceries, and I'll stay in my outfit". The grocery store has the gym in front of it and I'll say: "I'll do the exercise first". But as I'm walking toward the grocery store...I'll say: "no, I'll go after I do the groceries, cause I'm worried about the specials – that I won't get them...and then I look at all these bags that I've paid for, and I say: "if I bring them out to the car now...I'll go to the gym after – I'll just drop these in the car. ...Then I'm saying: "no, I have frozen products and I can't go to the gym – so what I'll do is I'll bring the stuff home". So, this goes on all day, and then I'll get home, I'll put all the stuff in the freezer...and then I'll say to myself: "oh, this outfit – I'm not comfortable – let me get out of it". ...And then I'm screwed, right? I'm out of my outfit. ...And then I'll eat. Then I'll be like: "I'm too full – I'll go in my sweat pants"., And the more – the lies to myself – and then, then I'm in my sweatpants, and I'll say: "well I can have a chocolate bar now, you know, and then I'll go". Right? ...And then it just gets worse and worse, cause then I'll say:"well, you know, I'm overweight – I shouldn't have eaten that chocolate bar...it's insane.

Negative/ambivalent mood, the fourth sub theme, captures a range of emotional responses to PA, from: "I don't feel like it", to more profound feelings such as frustration or even depression. While some respondents noted the mitigating effect of PA on these

feelings, responses were attributed to this category when responses stated the feelings were a barrier to PA: *"Well, if I wake up in the morning and I'm in a bad mood, and...can't seem to get my spirits up...I say to hell about the gym" (#3 -1).* The fifth sub theme, meaningful PA, refers to the preference stated by some of the women for seeking novel or purposeful opportunities that deviated from the regimented routines of "gym workouts" (i.e. running to referee soccer games) as a way to increase their motivation of undertaking PA: *"...when I have a reason and an activity I enjoy, it's much easier to be physically active" (#20 – 1).* The final sub theme, poor experience, captures the detrimental effects of prior negative experiences either in terms of their physical performance (i.e. frustration with perceived lack of ability) or emotional upset (i.e. a gym employee labelling a respondent "obese").

Psychosocial Factors

Psychosocial factors, refers to interactions and relationship patterns between the respondents and others that either encouraged or discouraged PA. The four sub themes are accountability to others, self-sacrifice, support, and responsibility to a dog. The first sub theme, accountability to others, was an enabling factor and referred to the degree to which the women felt beholden to others to keep to their PA commitments. This could be in the form of "gym buddies" or others who undertook the PA along with the study participants, or others who, simply by being aware of the women's plans, served as their consciences. For example, one women said *"...now I really can't bail cause everybody knows I'm going"(#20 - 1).* The second sub theme of self-sacrifice was a barrier in which women forewent their PA in order to attend to the needs or wants of others, as opposed to fulfilling competing obligations for themselves (i.e. conflicting appointments). As one women described

"...planning a time [for PA], but then something happens...somebody needs something, ...needs the car...phones...and I just can't fit it in" (#2 - 1).

The third sub theme, support, refers to the way in which others, by way of verbal encouragement, organizational help (i.e. a supportive workplace or a friend who will provide childcare), or social interaction (i.e. exercise as an outlet for sustaining contact with friends) enable the women to be active. This sub theme is bi-directional as the loss or lack of such support was cited as a barrier. An example of support as an enabling factor was *"...it's the support of my husband ...he knows how important it [PA] is to me...he's super, super supportive...and that means a lot to me" (#8 - 1).* Support was cited as a barrier when another woman said "*...oh forget it, I just want to go home...if I'd been meeting a friend...I wouldn't have been able to say that" (#20 - 1).* The final sub theme was feeling responsibility to a dog and this was an enabling factor. One woman described buying a dog so that her choice to exercise would be mandated: *"...I think: "I have to walk the dogs"...I have to because I don't have a choice, which is a good thing" (#1).*

Environment

The broad theme environment refers to the women's physical surroundings includes two sub themes: the built/ physical environment, and weather/climate. Both sub themes were bi-directional - cited as both enabling factors and barriers. The built environment was described in terms of how the infrastructure surrounding the women's work/life locations allowed for safe integration of PA into transportation or leisure activity: *"...my transportation then was bicycle. I was in Montreal and that worked well...it's not as bike*

friendly in Ottawa as it is in Montreal, believe it or not" (#9 -1). Other women enjoyed spending time in pleasant natural surroundings and the degree to which this motivated them to be active: *"...I will get out...and walk...throughout the experimental farm...I animal watch, and bird watch, and it's just a very nice area to walk" (#12- 1p).* The bi-directionality of the Weather/Climate sub theme was captured by the following quote: *"...it was a beautiful day out... and I just said: ok-get up and go...I'm not sure what we'll do in the winter, like the icy days and stuff we won't [walk the dog]" (#9 -1).*

Biophysical Considerations

Biophysical considerations, pertains to a woman's physical wellbeing and includes two barriers: injury/ailment and fatigue. Injury/ailment, captures the impact of either acute or ongoing physical constraints on their PA: *"...my physical activity has been compromised because I have a back and ankle situation" (#2 - 1).* The second sub theme, fatigue, captured responses wherein women articulated simply being "too tired" to be active were included in this category: *"...when I get home, I don't feel like it anymore, cause I'm too tired" (#4 - 1).*

Resources

Resources, defined as the assets women draw upon to carry out their everday lives, contains two sub themes: time and money. Time was cited by several as both and enabling factor and a barrier. Some women reported being at a point in their lives where they had more time to devote to PA, and others reported having much less time: *"That's pretty much all the time I have to exercise...because I'm a full time employee and I was also a full time*

student at the same time the past year" (#31- 2). Another woman discussed lack of money as a barrier to being physically active: *"...if you don't have money you can't join a gym or body building place...you can't do any of those things" (#12 - 1).*

Discussion

Principal Findings

Factors influencing PA patterns of perimenopausal women are multifactoral, and represent a complex intersection of internal and external factors. Six broad themes emerged: routine, intrinsic motivation, psychosocial factors, environment, biophysical issues and resources. Each broad theme was further categorized into two to six sub themes. The most cited enabling factors were: an established daily structure that incorporated physical activity (routine), anticipated positive feelings associated with PA (intrinsic motivation), and accountability to others (psychosocial factors). The three most prevalent barriers were disruptions in daily structure (routine), competing demands (routine) and self-sacrifice (psychosocial factors).

Interestingly, menopausal symptoms, or the physiological experience of undergoing the transition through menopause did not affect the women's engagement in PA. Rather, the majority of the enabling factors and barriers reported by the women were related to psychosocial aspects of this life stage. This finding is underscored by observations made by Im et al. (2010) that women mentioned fatigue and illness as specific barriers to exercise, but did not point to menopausal status as influencing their decision to be active.

Factors Enabling Women's Participation in PA

PA incorporated into daily structure was the most commonly-cited enabling factor and disruption to that structure was the second most common barrier. The extent to which the women were inclined and able to incorporate PA into their daily structure influenced the extent to which the PA became habitualized. The greater the degree to which the women were able to achieve automaticity within their daily structure, the less their actual performing of PA relied upon conscience thought or decision-making, and the less susceptible it was to usurpation. These observations coincide with earlier findings suggesting that maintaining consistency with respect to participation in PA is fortified as the activity becomes "habit" and an intrinsic part of a woman's daily and life routine (Conroy, Hyde, Doerksen & Ribeiro, 2010, Verplanken & Melkeviv, 2007). The MAPA theory discusses the effect of the "context of daily lives" on women's participation in PA (i.e. cultural and family norms) but does not explicate daily structure or routine. This is a departure from the present findings within which this theme was found to be influential.

Anticipated positive feelings was the second most influential enabling factor. The women discussed their recall of physiological and psychological enhancements to their wellbeing following PA, and how their desire to replicate those feelings was often of sufficient motivation for them to schedule PA and overcome incidental barriers to follow through. This sub theme corresponds with the concept of exercise self efficacy as discussed by Im et al., (2010) and others (Barnett & Spinks, 2007, McCauley & Blissmer, 2000). The feeling of achievement the women derive from not only having adhered to their "good" intentions to exercise, but also from continued, improved exercise competence, prompted

their continued participation. The emergence of this important sub theme coincides with the themes "perceived continuous power" and "experiencing benefits of body and mind" as articulated by the 12 perimenopausal women studied by Jeng et al. (2004), and with the concept of "physical activity self-efficacy" as described within the MAPA theory (Im et al., 2010).

The third most cited enabling factor, accountability to others, found within the broad theme psychosocial factors, was described by eight of the women, and refers to the women designing interactions so as to be beholden to another person or group with respect to upholding their commitment to PA. Eyler et al., (1999) suggest capitalizing on this aspect of women's motivation by facilitating conditions to enhance social support and, by extension, accountability to those within the mutual involvement (i.e. family, friends etc.). The presence of accountability to others and the other psychosocial sub themes was often intentional, and reflected a conscious effort on the part of the women to construct life situations, in some cases desirable "conspiracies", wherein the decision to be active was cast as a welcome default as exemplified by feeling responsible to a dog. The MAPA theory entails the concept of "social influence" and the concept briefly discusses the importance of supportive friends, family, health practitioners etc with respect to a woman making and upholding the decision to be active, however, accountability, as it is delineated within the present findings is not specified within MAPA (Im et al., 2010).

Barriers to Women's Participation in PA

Other demands, as a sub theme of 'routine', emerged as the most influential barrier; it was cited by 18 of the women. Women discussed the challenges they face in their efforts to preserve their commitment to PA in light of the other, often competing demands placed upon their time, energy and resources. While this sub theme is described separately from that of disrupted daily structure, the two overlap to produce a situation wherein the plan women had crafted for their day (or their lives) becomes vulnerable to competing interests both internal and external to themselves.

Typical conflicts within this sub theme existed between obligations the women had to themselves (i.e. medical appointments scheduled during regular PA time) or those they perceived in response to others (i.e. cleaning the house in anticipation for company rather than upholding regular PA schedule). Im et al. (2010) captures similar findings within the "Context of Daily Lives" concept in the MAPA theory. Within the MAPA theory, this concept encompassed the elements of environment and sacrifice, along with the varied obligations for which the women felt responsible. The present study separated these themes to be consistent with the segregation found within the women's responses. The types of demands competing for a woman's time were described as those attributable to work and home (partner, children etc). This theme aligns well with earlier studies that showed women's participation in PA is affected by the multiple responsibilities they carry at home and at work (Verhoef, Love & Rose, 1992).

Two barrier sub themes of intrinsic motivation – negative/ambivalent mood and self sabotage – were used to capture the confluence of cognitive and emotional elements underlying the women's decision-making pertaining to PA. Their actions would seem to demonstrate a response to, if not an acknowledgment of, their emotional state (I don't feel like going to the gym") as it conflicts with their cognitive appraisal ("I should exercise"). The resulting self sabotage resembles an attempt to justify their ambivalence overtaking their intention. A more thorough examination of the sources of the need for such a justification might be a beneficial focus of future research. If health care professionals can facilitate an honest recognition and exploration of this emotional picture, it follows that a more honest and sustainable response (i.e. a PA regimen that aligns well with a woman's true values) might result.

Environmental concerns have been noted previously as factors affecting participation in PA (Im et al., 2010, Barnett & Spinks, 2007). Interestingly, in the present study, climate was ascribed less overall importance by the women despite having conducted the research within the variable and often extreme Canadian climate (i.e. hot, humid summers, and extremely cold winters). This broad theme seemed to be one whose influence was determined by other factors described above. More specifically, if a woman's daily and life structure is infused with motivation and support for her PA, she seems better able to adapt to, her environment, and allocate less importance to the weather.

Women's perceived health (including menopausal status) has been cited as having bearing upon their decision to be active (Im et al., 2010). In the present study, the eight

women attributing their reduction in PA to physical issues did so in response to injury or ailments, or fatigue. None of the women referred to their menopausal symptoms or status as an "ailment" or as a barrier to PA.

Implications for Health Practitioners

The present findings correspond well with those of Netz et al. (2008) who pointed to participation in PA as a strong predictor of the health of women during and following midlife, and to the complexity of the relationship between factors that ultimately result in an increase, maintenance, or decline in that level of participation. These authors suggested that the decision to undertake PA was not simply a matter of knowledge, but was affected by "social, emotional or other psychological factors" (Netz, Zach, Taffe & Guthrie, 2008). The findings of the present study are consistent with these findings as none of the barriers or enabling factors described by the women rested on knowledge or lack thereof. This suggests that for clinical interventions to be successful, they must move beyond passive education and simple recommendations for women to increase their participation in PA, and adopt an approach that encourages women to evaluate their lives as a whole, to determine how PA fits into their routine, and to establish the supports and resources they need to achieve that integration.

An important goal among health practitioners is to encourage their clients to make healthy lifestyle choices, such as engaging in PA, a priority. Priority was the fourth sub theme attributed to the broad theme routine and referred to the inclination and ability of the women to prioritize PA within their daily structure and life routine. When present, it was a

buffer to would-be barriers. For example, one woman spoke of her ability to reschedule her PA when other obligations took place during her regular PA time: *"...work gets in the way...and I feel lousy when I didn't...get the exercise in. But I know, because I'm committed, that I'll go the following day" (#25 – 2).* The manifestation of prioritization as an increase in PA seems to represent the ultimate balance of internal motivation versus external challenge. While knowledge of PA as an important aspect of health may be part of the internal dialogue that produces prioritization, the findings of the present study suggest that the process is more involved, and that health care interventions addressing only the knowledge aspect of prioritization are incomplete (Im et al., 2008).

The women described a life stage wherein they are beholden to partners, children, parents, bosses, and auxiliary persons related to each (i.e. teachers, parent's caregivers etc). Women already perceive that they "should" be more active (Dixon, 2009). The goal of health professionals, then, is to assist women in translating that conviction into a positive motivating factor as opposed to a source of frustration – one more obligation that the women must struggle to meet. Health professionals with an awareness of this conflict are better positioned to make recommendations of relevance to their clients. For PA to evolve beyond a chore-like obligation, to an experience that achieves anticipated positive feelings, women must engage in some degree of self-reflection in order to determine what sort of activities are likely to produce such an experience for *them* (Segar, Eccles & Richardson, 2008). Guiding women to and through that conversation with themselves appears to be a worthwhile endeavour for health professionals, based on the present findings.

Strengths and Limitations

To enhance the credibility of findings, the interviews took place in natural settings, the time and place of which were determined by the respondent. Interview transcription was carried out by one of two independent researchers, and then quality – checked by both as each transcription was heard during analysis. Credibility of the present findings was also strengthened through ongoing data analysis by the primary researcher and an independent Research Assistant. Agreement was reached by consensus on all themes. The frequent debriefings allowed for frank and objective discussion and challenge of the interpretation of the women's responses (Guba & Lincoln, 1985). Dependability was ensured during data collection by adherence to the interview script and by maintaining a detailed audit trail throughout the data analysis process (Guba & Lincoln, 1985). Finally, themes were derived from women's own words thereby facilitating translation back to women.

A strength of conducting this qualitative study within the broader context of the Sherbrooke-Ottawa-Montreal Emerging Team (SOMET) study was the ability to test the assumptions of saturation (Francis, 2009). We were able to provide evidence that saturation reached by 10 interviews in the first set of 13 interventions was stable with no further themes emerging with the subsequent set of 13 interviews.

Despite efforts to recruit women with a various personal characteristics, few participants had low SES or more severe menopausal symptoms. This may have influenced the finding that menopausal symptoms did not appear to influence engagement in PA. However, the severity of menopausal symptoms experienced by women in our study were

similar to other studies of peri-menopausal women (Woods & Mitchell, 2005 & McKinlay, Brambilla & Posner, 1992).

Conclusions

Perimenopausal women's participation in PA is the result of a complex interplay of social, emotional, environmental, and psychological factors. Neither menopausal symptoms, nor knowledge deficit play a significant and direct role in women's engagement in PA. The most profound enabling factors influencing a woman's participation in PA was attributable to the structure of her daily life, the positive feelings she derives from activity, and the accountability she incorporates into her relationships with others. The most significant barriers were other demands, disrupted daily structure, and self- sacrifice. For clinicians, a conversation wherein assessment of a woman's participation in PA extends beyond the individual, to a wider focus on her life, could provide an empowering experience. For the effort to be worthwhile, the clinical conversation must extend beyond PA as a solution to health risks and to address those factors that impede its implementation in perimenopausal women.

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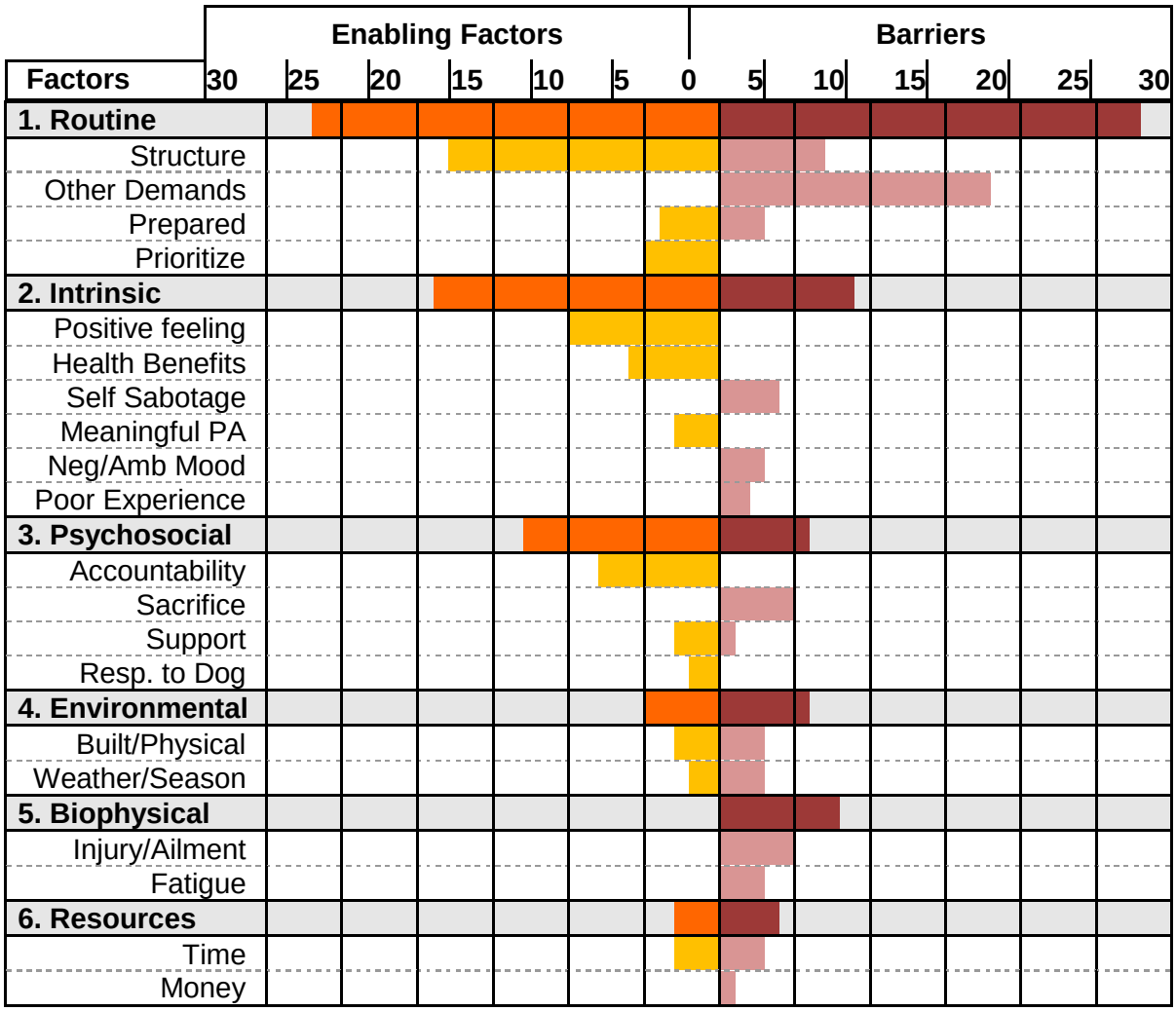
Table 3.1- Demographic Information

Characteristic	Group #1 (N = 13) Frequency (%)	Group # 2 (N = 13) Frequency (%)	Total (N = 26) Frequency (%)
Age			
40 – 44	4 (31%)	2 (15%)	6 (23%)
45 – 49	4 (31%)	1 (8%)	5 (19%)
50 – 54	3 (23%)	9 (69%)	12 (46%)
55 - 59	2 (15%)	1 (8%)	3 (12%)
Education			
Secondary	0 (0%)	1 (8%)	1 (4%)
Some College	1 (8%)	1 (8%)	2 (8%)
College	2 (15%)	2 (15%)	4 (15%)
Some University	2 (15%)	1 (8%)	3 (12%)
University	8 (62%)	6 (46%)	14 (54%)
Other	0 (0%)	2 (15%)	2 (8%)
Neighbourhood SES			
High	3 (23%)	4 (31%)	7 (27%)
High/Middle	8 (62%)	5 (38%)	13 (50%)
Low/Middle	1 (8%)	1 (8%)	2 (8%)
Low	1 (8%)	1 (8%)	2 (8%)
Unknown	0 (0%)	2 (15%)	2 (8%)
Financial Situation			
Comfortable	9 (69%)	6 (46%)	15 (58%)
Sufficient	2 (15%)	6 (46%)	8 (31%)
</= 49 000	2 (15%)	0 (0%)	2 (8%)
</= 99 000	3 (23%)	3 (23%)	6 (23%)
>/= 100 000	6 (46%)	7 (54%)	13 (50%)
Unknown	2 (15%)	4 (31%)	6 (23%)
MRS Score			
0 – 10	7 (54%)	2 (15%)	9 (35%)
11 – 20	4 (31%)	9 (69%)	13 (50%)
21 – 30	1 (8%)	2 (15%)	3 (12%)
31 – 40	1 (8%)	0 (0%)	1 (4%)
>40	0 (0%)	0 (0%)	0 (0%)
No Menses X 1 Year			
Yes	3 (23%)	5 (38%)	8 (31%)

Figure 3.1 – Factors Influencing Women Engaging in PA



- Bars to the left indicate enabling factors and bars to the right indicate barriers to engaging in PA. The bars for the six broad themes represent the number of participants who identified one or more of the subthemes.

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Chapter 4 - Integrated Discussion

This chapter provides a global discussion of the findings from the environmental scan of websites to determine quality of evidence-based information for perimenopausal women (Chapter 2) and the qualitative study of barriers and enablers to perimenopausal women's engagement in physical activity (Chapter 3). Following the global discussion, implications for nursing practice and future research are suggested.

Global discussion

Findings of the two studies undertaken within this thesis serve to illustrate the disconnect between how the healthcare community is framing an important issue – body weight changes during perimenopause – and the needs of this specific population. The prevailing focus of the information sources assessed in the environmental scan appears to be one based on the medical model with an emphasis on the physiology of menopause, and recommendations toward general lifestyle alterations. The findings of the qualitative physical activity (PA) study suggest that a socioenvironmental perspective is more inclusive of the way in which women describe factors influencing engagement in PA. The women did not discuss the physical aspect of menopause as a factor in their undertaking of PA, nor did they contextualize themselves as having exclusive power over their decisions. Instead, they spoke of their desire to regain and/or maintain their health despite the many competing demands placed upon their time and energy. Four primary issues integral to this disconnect are:

a) Increase access to evidence-based information about body weight changes during the transition to menopause to address women's needs
b) Framing lifestyle change to increase PA within the broader context of women's lives
c) Encouraging unstructured and meaningful PA that emphasizes fun and inclusivity
d) Expanding health websites to support psychosocial enablers to PA
e) Enable women to negotiate enabling factors and barriers impacting PA to reduce time spent being sedentary.

While diet is also an important factor in maintaining a healthy weight, the focus of this thesis in on PA to better understand the decline in engagement for women at this life stage.

Access to Evidence-based Information

The environmental scan revealed that women seeking evidence-based information about weight changes during perimenopause from health organizations, will encounter difficulty and possibly frustration due to the lack of such information available online. The information that was available, with the exception of one website that used primary research, was vague in nature; often addressing obesity prevention and healthy lifestyle choices from a generalist perspective as opposed to one targeting perimenopausal women. While the qualitative study did not reveal knowledge deficit to be an identified barrier for perimenopausal women with respect to undertaking PA, other sub themes that did arise are likely to be impacted by the present shortage of information; namely perceived health benefits and ability to prioritize PA. The qualitative study did provide evidence indicating a very busy life stage for women who are seeking to balance the responsibilities they feel

toward others with their own needs. It is known that perimenopause represents a life stage wherein PA can be of great benefit to women (Simkin-Silverman et. al., 2003). However, findings from the qualitative study suggest that if women are to be supported in making informed decisions about PA, they need access to trusted information.

Along with a general lack of information pertaining to prevention of weight gain during perimenopause, two websites provided information that was not evidence-based and in fact not consistent with research. For example the Eat Right Ontario website stated: "weight gain is part of the natural aging process... it is not usually caused by menopause". This statement is likely to give women the impression that there is no increased risk of weight gain for them attributable to the perimenopausal transition. This is at odds with several studies that found the physiological and lifestyle changes (i.e. hormonal shifts and decline in PA) associated with perimenopause often lead to an increased risk for weight gain for women during this life stage (Ho et al., 2010; Lovejoy, 2008; 2009; Keller et al., 2010; Sowers et al., 2007). In essence, the absence and conflicting nature of the information available to perimenopausal women with respect to preventing weight gain might give the impression that the issue is not worthy of their concern when so many others are competing for their attention.

While findings of the environmental scan served to underscore the lack of information available regarding prevention of weight gain during perimenopause, the findings of the qualitative study are instrumental in showing specifically what kind of information is missing. The women did not indicate that they were unaware of the

importance of a healthy diet or engaging in PA. Based upon their responses, the general messages of "diet and exercise" have resonated, however, the host of factors impeding their desire and/or ability to heed that knowledge (i.e. juggling competing demands, the importance of accountability to others) are not addressed. The status of the information is presently weighted heavily in favour of medical and general lifestyle approaches to health – focusing on the individual physiology of the perimenopausal transition (i.e. loss of lean muscle mass) and general lifestyle guidelines (150 minutes of moderate to vigorous PA per week Canada's Physical Activity Guide) (Lovejoy, 2009, Potter & Perry, 2001). The findings of the qualitative study suggest that this approach is not comprehensive and fails to account for the majority of the barriers and enabling factors to PA cited by the women. For them, whether or not they undertake PA is not a decision affecting one individual (themselves), but rather is one part of a life's mosaic containing the roles they assume in many contexts. Fashioning a routine that incorporates PA, negotiating equitable division of family tasks, or cultivating relationships with others likely to encourage PA are prospects better informed by the socioenvironmental approach to health (Potter & Perry, 2001, Huang & Glass, 2008 & Lindsay, 1996). At present, this is not the strategy undertaken by the sources for online information by health organizations, but rather the perspective seems to imply that women make decisions for themselves in isolation of these broader issues. The findings of the PA study indicate the need for evidence-based information that is more responsive to the realities facing women within the socioenvironmental context during the perimenopausal life stage.

Framing Lifestyle Changes within a Broader Context

Of further concern with respect to the emphasis on a medicalized approach are the findings of the qualitative study that most of the women (85%) reported mild to moderate menopausal symptoms, and do not perceive those as a barrier to PA. Further, none of the women reported engaging in PA to alleviate their menopausal symptoms. These data illustrate the disconnect between the emphasis in online resources that indicated PA can alleviate menopausal symptoms and the findings of the qualitative study that showed women do not place a great deal of significance on PA for this reason (Reisco et al., 2010 as cited by the Canadian Obesity Network & Haldimand Norfolk Health Unit, 2011). This suggests that while evidence for PA as a possible alleviant for menopausal symptoms is useful information, framing the discussion around PA exclusively on those terms is less likely to result in increased participation than a discussion that is holistic in nature and assists women to evaluate the importance of PA to them and how they might best integrate it into their busy lives (Im et al., 2008 & Segar et al., 2008). Alternatively women in the PA study were motiviated to enage in PA for general health benefits. Several women (50%) cited discussed health advantages such as stress reduction, promotion of "good sleep" and motivation to eat a healthy diet.

Encouraging Unstructured and Meaningful PA

Women in the PA study appeared to value focus on active lifestyle rather than the more traditional regimented (i.e. gym workouts) PA. Five of the women (19%) spoke directly to their preference for unstructured, novel, or purposeful activity (i.e. repelling, acting as a soccer referee etc.). They suggested that because these activities did not "feel

like working out" but "had a reason" or were just more fun, they did not experience the sense of grudging obligation described in other interviews. Morgan (2001) suggests that approaches to promoting physical activity would benefit from a "paradigm shift" that sees recommendations based on the life context and preferences of each individual. Specifically, he posits that intensity and type of exercise should be driven by the subjective experience of exertion rather than pre-determined targets. The data underlying Morgan's hypotheses were derived from research involving "college-age" women, however, the premise appears to hold with the present findings as well. It seems that, for these women, such benchmarks add to a perceived obligatory element of exercise, which does not motivate, and may indeed undermine intentions to be active.

Building upon the emergent sub theme, meaningful PA, and the articulation by Morgan (2001) of "purposive" versus "purposeless" physical activity, active transportation fits. Three of the women in the PA study specified a preference for biking or walking to work, and described a disruption in their overall activity level when they were unable to do so. Others, while not declaring their desire for these transportation options outright, pointed to their built environment as precluding any hypothetical intentions of active transport they may have considered. Neighbourhood design that does not facilitate, or even impedes active transportation is a factor of so-called "obesogenic" environments (Keller et al, 2010, Harrington & Elliot, 2009). In their review of the literature, Black and Mackinco (2007) discuss the impact of neighbourhood design on rates of physical activity, and report that mixed land use (i.e. residential, commercial etc.), access to fitness facilities, and overall walkability contribute favourably to physical activity. These observations may seem

straightforward on the surface, but their consideration was sometimes lost as the women in the PA study explained their activity levels as a personal response to an environment (i.e. neighbourhood design) over which they had little control as individuals. The dissonance created by the self-imposed expectations around PA, and the constraints placed upon their meeting those expectations seemed to manifest as confused discouragement. Women could be encouraged to incorporate novel and purposeful activity into their daily structure.

Expanding Health Websites to Support Psychosocial Enablers to PA

Another opportunity that builds upon identified barriers and enablers to PA and expands use of websites identified in the environmental scan is interactive web-based PA interventions. As discussed in Chapter 2, women are increasingly consulting the internet for health information and in fact women are outpacing men in use of social media online applications (i.e. Twitter, Facebook) with older adults having the most pronounced increase in use (Dewing, 2005 & Fallows, 2005). Concurrently, health clinicians are increasingly harnessing the communication potential of social media to convey messages to clients and endeavouring to structure such interactions as two-way conversations rather than continuing to bombard the public with general health messages (O'Dell, 2011). In their meta analysis of 11 754 participants (5841 women and 5729 men with an average age of 41.5 years) Wantland, Portillo, Holzemer, Slaughter & McGhee (2004) showed improved outcomes for web-based interventions in areas of increased PA, knowledge of nutritional status and participation in healthcare. Another systematic review exploring the efficacy of web-based PA interventions showed that while methodological standardization was lacking, there is evidence supporting the use of online interventions aimed at improving participation in PA

(van dan Boerg, Schoones & Vlieland, 2007). Therefore current websites of health organizations in Ontario could be expanded to include more social media applications to promote conversations with and/or commitment from perimenopausal women about engaging in PA.

Along with the use of the internet and social media as conduits for interactions between perimenopausal women and others, the qualitative PA study also yields findings suggesting that employing the medium as an avenue of connection between women with similar lifestyle goals and concerns is a worthwhile area of exploration. Support (social, familial, employer), and accountability to others were sub themes cited by 17 women (65%) in the PA study. The use of the internet and specifically by social media sites to foster that support bears consideration when planning community health promotion interventions. Women are already using these resources for communication and to acquire health-related information (Dewing, 2010, Fallows, 2005). Capitalizing on those established patterns makes sense in terms of the findings of the PA study, and could take the form of facilitated online forums, Facebook groups dedicated an activity etc. Crafting interventions around social media meets women where they are already likely to be (online) thereby respecting their already busy schedules, utilizes a medium they are comfortable with, and has the potential to foster enabling factors toward PA that they have identified (support and accountability).

Implications for Nursing Practice

Registered Nurses (RN) and Advanced Practice Nurses (APN) have many potential roles to undertake in the implementation of enhanced health programs for perimenopausal women (Table 4.1). By interacting with individuals and groups at all levels of care (primary, secondary and tertiary), nurses in both categories are in a unique position to explore the barriers and enabling factors unique to each woman, and capitalize on her values and preferences as they pertain to PA. In Canada, two classes of APN are recognized: the Clinical Nurse Specialist (CNS) and the Nurse Practitioner (CNA, 2008). The roles and scope of practice for APNs extend beyond those of the RN along the following competencies: clinician, consultant, educator, researcher, leader (CNA, 2008). The advanced educational preparation and scope of APN practice positions these nurses as leaders able to affect change upstream of many of the factors identified in the qualitative study as affecting PA among perimenopausal women. For example, researching, crafting and promoting healthy workplace policies that afford women opportunities to incorporate PA into their work day are actions that would fall within the domain of APNs. APNs and RNs work in a variety of settings (i.e. primary health care, public health etc) and their roles are complimentary in the delivery of health interventions for all populations. The following section discusses various roles for nurses and potential nursing interventions to address factors influencing perimenopausal women's PA behaviours.

Table 4.1 – Roles for APNs and RNs Related to Promoting PA among Perimenopausal Women

Nursing Role	Actions	Barriers/Enabling Factors Addressed*
1. APN and RN – Primary Care Setting	1. Conduct health assessment emphasizing psychosocial context of client lives. 2. Promote community resources related to PA and other determinants (i.e. affordable childcare etc). 3. Incorporate evidence – based approaches to promotion of PA. 4. Guide decision-making related to PA as a resource for improved quality of life. 5. Collaborate with professionals in related fields (i.e. social work) to fortify a comprehensive approach.	• Daily structure (1) • Perceived health benefits (1,3) • Meaningful PA (1,2) • Time (1,3)
2. RN and APN in Public Health	1. Design and implement workplace wellness incentives for PA 2. Facilitate community capacity building to enhance availability of low cost year-round community PA. 3. Create online listings of local PA groups, clubs etc that promote fun and inclusive PA options. 4. Encourage discussion of family role-sharing in prenatal classes. 5. Advocate for inclusive and equitable public policy that works to enable healthy lifestyle choices.	• Daily structure (1,5) • Other demands (1,5) • Money (2,3,4) • Weather/climate (2,3) • Support (1,3,4) • Accountability (1,3,4) • Meaningful PA (3,4) • Poor experience (4) • Sacrifice (5)
3. Areas of Future Nursing Research	1. Explore barriers and facilitators to women of lower SES engaging in PA 2. Evaluate social media interventions to enhance perimenopausal women's PA 3. Examine psychosocial influence on women's lifestyle behaviours.	• Daily structure (1,2) • Other demands (1,2) • Sacrifice (1) • Support Accountability (1,3) • Meaningful PA (3) • Perceived health benefits (4) • Time (3) • Money (3)

*Bracketed numbers correspond to the numbers in the preceding "Action" cell

Nurses in primary care

The conversation between nurses and clients around the benefits of PA is important during every life stage and especially so for perimenopausal women (Simkin-Silverman et al., 2003). The findings within the present thesis suggest that perimenopausal women are not entering this conversation with a knowledge deficit with respect to the need to incorporate PA into their lives, and a discussion that fails to move beyond such a prescription may be of limited efficacy. In fact, many of the women interviewed spoke to the dissonance they experience between possessing this knowledge and their limited ability to act upon it. It therefore merits more of a holistic approach when discussing weight management and PA with clients. Of the six broad themes to emerge from the primary study, only one (biophysical issues: fatigue and injury/ailment) was not socioenvironmental in nature. With respect to barriers to PA, women talked about disruptions to their daily routines, the many demands competing for their time, the sacrifices they make for their families, and their need for improved organization. A nurse prepared to meet women at the intersection of these issues, will be better-equipped to help them address their needs with respect to their PA (Im et al., 2008, Dixon, 2009).

Public Health

Moving beyond general PA recommendations goes further upstream than the encounter with clinical nurses. Within the realm of public health, the environmental scan shows much room for improvement with respect to the quality of information being provided to women regarding body weight changes during perimenopause (see Table 4.1). Obesity prevention in general is of paramount importance to public health workers (Stamler & Yiu,

2008), and so it follows that programming targeting a population at particular risk for developing obesity bears consideration. Building upon the findings of the environmental scan, health units can take considerable steps toward augmenting the current availability and quality of evidence-based information accessible to women regarding body weight changes during perimenopause and effective interventions, including PA. There is a need for consistency and recommendations based on current evidence to avoid confusion and misinformation among women seeking to inform themselves. Since many women currently are consulting the internet for their health information, it follows that websites associated with health units and other health agencies are good starting points for improved dissemination of the evidence surrounding weight gain in perimenopause and the role of PA and nutrition in its prevention, management, or mitigation (Fallows, 2005).

Beyond providing information, those working in public health have the opportunity to implement PA programs that are effective for perimenopausal women (Stamler & Yiu, 2008). Programs that address the barriers and capitalize on the enabling factors described in the PA study may achieve greater results with this population. Possible examples include: discussing concepts of partnership, self care, and equitable division of familial responsibility, promoting workplace incentives that accommodate PA onsite and/or during the work day (i.e 15 minute extension at lunch hour to allow for showering and clothing changes), organizing adult fitness alternatives that correspond to time and location of children's activities (i.e. Tai Chi on soccer sidelines), provide forums for women with similar PA interests seeking companionship (and, by extension, accountability), advocating for use of public spaces for free or low cost PA (i.e. opening up local schools after hours for

indoor walking in the winter months) (Kingston Frontenac Lennox and Addington Health Unit, 2011, Dixon, 2009, Kahn et al., 2002, Leeds Grenville and Lanark District Health Unit) . This type of programming moves beyond the traditional approach of informing women about PA guidelines to better address the needs identified by the perimenopausal women in the qualitative study.

Of the 12 enabling factors toward PA to emerge from the primary study, 9 (75%) were psychosocial in nature (i.e. amenable home routine, accountability, support etc), suggesting that, for many women, the support and inclusion of others is integral to their successful adherence to PA (Im et al., 2008, Welch et al., 2008 & Kahn et al., 2002). Furthermore, the enabling factor sub theme, meaningful PA, captured a preference for activities that fell outside of stereotypical regimented gym routines (Segar et al, 2008). The women spoke of their disdain for the chore-like obligation they felt was attached to such activities, and how when they were able to undertake other activities (i.e. hiking) they found enjoyment and reward in the exercise – thus instilling the anticipated good feelings that also emerged as an enabling sub theme. It follows then, that a role for clinicians and public health nurses might entail maintaining current listings of such opportunities within the communities they serve. Nurses and health professionals in the community are likely to interact with a wide variety of age groups; thereby, positioning them well to promote local activities, volunteer opportunities and interest groups that afford women more alternatives with respect to their PA. Interestingly, none of the health units observed in the environmental scan provided information on local options for PA. Women seeking information with respect to weight management and PA would benefit if alongside the

recommendations for PA, they also saw opportunities to adopt such recommendations within their communities. Such an approach affords those working in health care to not only promote, but also facilitate PA among their perimenopausal clients.

Future Nursing Research

The present thesis naturally leads to three main implications for nursing research with respect to body weight changes in perimenopausal women: exploring barriers and facilitators to women of lower SES engaging in PA, evaluating online social media type interventions to enhance perimenopausal women's PA, and further examine the psychosocial influence on women's lifestyle behaviours. First, the findings of the PA study would benefit from testing with a sample that entailed a stronger representation from among women of lower socioeconomic status. Only one women from within the present sample cited financial concerns as a possible barrier to PA, and she did so hypothetically. It is anticipated that lack of affordable options might hold be of greater concern to women from less financially secure backgrounds (Berg & Cromwell, 2002 & Evanson et al., 2002). A replication of the study under such conditions would help inform clinical and public health practitioners positioned within such population with respect to their lifestyle-based interventions.

The psychosocial dynamics included in responses by the women in the PA study point to the merits of further investigation into how life trajectory and biology intersect at perimenopause, and the resulting constraints placed upon lifestyle decisions available to women at that time. The women in the qualitative study cast menopausal symptoms as

incidental occurrences that they manage along with the many other issues and responsibilities to which they attend at this life stage. The disconnect between the emphasis on biology observed in the environmental scan, and the emphasis on the psychosocial observed in the PA study is suggestive of a need to adopt an ecological, whole-person approach to further research directed toward furthering understanding of prevention of weight gain and perimenopausal women. As well, as noted within the PA study, the sub theme of priority emerged as an enabling factor both articulated by the women and as an underlying sub theme. Further exploration into how some women established their unique triage of issues to place PA near the top is worthwhile as it might yield some insight that can be built upon within the clinician/client relationship.

Further exploration into innovative and effective interventions utilizing web 2.0 technology and social media is warranted based on the findings of the environmental scan and a review of the evidence that suggests women are increasingly using web-based sources for health information and communication (Dewing, 2005 & Fallows, 2005). The results of the qualitative study also suggest that the features of social media (i.e. interpersonal connection) could be instrumental in addressing some of the barriers and enabling factors identified (social support, accountability), however there is a gap in the knowledge around efficacy and cost effectiveness (van dan Boerg et al., 2007).

Conclusion

Perimenopausal women are at increased risk of weight gain and subsequent obesity due to both physiological and lifestyle changes associated with this life stage. While PA is an important component of maintaining a healthy weight, many women are not active through the perimenopausal life stage. There is a lack of evidence-based information available to them with respect to the presence and nature of this increased risk, and that which is accessible does not address the barriers the women themselves identify such as competing life demands, disrupted daily routine, and self-sacrifice. Nor does the current online information capitalize on the enabling factors that are important to women that include having a well-established routine that emphasizes PA, anticipating good feelings associated with PA, and being accountable to others. Future programs aimed at preventing obesity within this population might be more effective if these findings are integrated into their design.

Chapter 5

Contributions to the Thesis

This chapter provides a description of the contributions made to the generation of this thesis by the primary researcher, members of the thesis committee, and auxiliary members of the research team (see Table 5.1).

Table 5.1 – Contributions of research team members to thesis

	Thesis Proposal	Chapter 1 – Integrated Introduction	Chapter 2 – Environmental Scan	Chapter 3 – Physical Activity Study	Chapter 4 – Integrated Discussion
Direction and Design	DM DS	DM DS AD KW	DM DS	DM DS AD KW	DM DS AD KW
Data Management	DM	DM	DM	DM SM	DM
Data Analysis	DM	DM	DM SM	DM SM Verification/audit (DS,AD, KW)	DM
Draft Documents	DM	DM	DM	DM	DM
Document Revision	DM DS	DM DS AD KW	DM DS SM AD KW	DM DS SM AD KW	DM DS AD KW
Approval of Thesis (proposal) for Submission and Publication	DM DS AD KW	DM DS AD KW	DM DS AD KW	DM DS AD KW	DM DS AD KW
Responsible for Overall Content	DM	DM	DM	DM	DM

The primary researcher, Deanne McArthur, BScN, RN (DM) identified the area of interest and concentration for the thesis, and led all aspects of data management and analysis, as well as the generation of documents resulting from those efforts. DM is a Registered Nurse with clinical practice background in public health and mental health. She has worked

as a research assistant to Dr. Dawn Stacey and Dr. Adena Scheer, both of University of Ottawa.

Dr. Dawn Stacey, PhD, CON (C) (DS), acted as thesis supervisor, providing guidance with respect to the integration of the research interests represented by the present thesis and the work undertaken by the Sherbrooke Ottawa Montreal Emerging Team (SOMET) study. Dr. Stacey facilitated inclusion of DM in the work undertaken by the SOMET group including access to the qualitative data gathered during the interview process of the larger study. Dr. Stacey afforded guidance pertaining to the design and theoretical basis of the study, as well as editorial advice with respect to all documents associated with the present thesis. DM collaborated with DS to undertake the environmental scan and to build upon those findings to design the physical activity study.

Members of the thesis committee were invited based on their expertise with qualitative methods, women's health, multidisciplinary perspectives, and familiarity with the overall research objectives and progress of the SOMET study. Committee members included Dr. Alexandre Dumas, PhD (AD), and Dr. Kirsten Woodend (KW), PhD. AD is an Associate Professor with the School of Human Kinetics at the University of Ottawa whose research interests centre on the sociology of bodily practices, the theory of Pierre Bourdieu applied to physical activity and sports, the relation to the body of adolescents and older adults, and contemporary discourses on anti-aging. KW is the Dean of the School of Nursing at Trent University with research areas that include women's cardiovascular health, cardiovascular health services, seamless and telehome care. Drs. Dumas and Woodend

attended several briefings and received status reports throughout the progress of the present thesis and provided input as to the design of the study, the literature consulted, the formulation of the research questions, and presentation of the data. Dr. Dumas also provided feedback following a presentation on preliminary findings of the PA study (Chapter 3) made by DM to the SOMET group ..

Sarah Mullen (SM), MSc., in her capacity as research coordinator for Dr. Dawn Stacey collaborated with DM providing independent analysis of the sources evaluated in the environmental scan and the responses generated by the respondents within the physical activity study. Both SM and DM undertook transcription and analysis of the interviews in the physical activity study. SM also provided editorial feedback pertaining to the environmental scan and physical activity study written by DM.

Anton Sarrimaki (AS), in his capacity as technical administrator and analyst for the Patient Decision Aids Research Group, provided assistance with respect to the formatting tables and presentations accompanying this thesis.

DM established the parameters for the sample, undertook data collection and analysis with SM, and generated all documents and presentations with feedback from DS, AD, KW, SM, and technical assistance provided by AS.

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Appendix A

Perimenopausal women's perception of decision making needs related to body weight changes during the transition to menopause

Dawn Stacey[1], **Sarah Mullan**[1], Janet Jull[2], Alexandre Dumas[1], Irene Strychar[3], Kristi Adamo[4], Martin Brochu[5], Denis Prud'homme[1]
[1] Faculty of Health Sciences, University of Ottawa
[2] Faculty of Graduate Studies, Population Health, University of Ottawa
[3] Centre de reserche du Centre Hospitalier de l'Université de Montréal
[4] Healthy Active Living and Obesity Research Group, Children's Hospital of Eastern Ontario
[5] Faculty of Physical Education and Sports, University of Sherbrooke

Background
Women transitioning through menopause are at higher risk of abdominal fat mass gain and associated health problems. Little is known about effective and sustainable ways to inform perimenopausal women's decisions about body weight changes. This study explored factors influencing perimenopausal women making and implementing decisions about achieving and/or maintaining healthy body weight.

Design and methods
A descriptive study using an interview-guided survey with women aged 40 to 65 years who are perimenopausal. The survey was adapted from the Population Needs Assessment Tool that is based on the Ottawa Decision Support Framework and customized for the study. Descriptive analysis was conducted and thematic qualitative analysis for open questions.

Results
Preliminary findings as of December 2010 are based on 21 women who were typically: 50 years of age (range 41-61), married, with a university degree or college diploma, and a BMI of 27.7 (range 20.4-44.9). Of the 21 women, 18 (86%) identified the decision: changing behaviour to lose weight. Common options: continuing current behaviours versus increasing physical activity, changing food intake, and/or other (e.g. eliminating alcohol, obtaining advice from specialist, joining weight loss group, taking supplements). Women perceived decisions as being difficult due to a lack of support from others (n=7), not enough time (n=6), and low motivation or not feeling ready to make the decision (n=5). Ways for obtaining information and support for making decisions included: getting information on choices (n=13), other's decisions/advice (n=5), self-motivation (n=5), considering pros/cons (n=4), support from others (n=4), and 'common sense' (n=4). Preferred sources of information were: information materials (n=20), counseling (n=20), face-to-face discussion (n=16), and social networking websites (n=11). Factors identified as facilitating implementation of their decisions were: self-motivation (n=8), encouragement from others (n=4), and feeling good about oneself (n=4). Barriers to implementation included: lack of time (n=7), fatigue (n=4), too busy (n=4), and working full-time (n=4).

Conclusion

Preliminary findings identified many factors that influence making and implementing decisions about weight loss in perimenopausal women. Findings will be used for the development of effective knowledge translation tools for informing women about emerging evidence related to body weight changes and supporting their decisions.

Appendix B

Post-Interview Questionnaire

Please take a few minutes to complete this 5-page questionnaire. The questions are designed to give the research team a better idea of your confidence in your decision to lose or maintain weight through the transition to menopause, your menopausal symptoms, and demographic information.

1.0 My confidence in making an informed choice

Below are listed some things involved in making an informed choice. Please show how confident you feel in doing these things by circling the number from 0 (not at all confident) to 4 (very confident) for each item listed below.

I feel **confident** that I can:

1. Get the facts about options available to me	**not at all confident**	0	1	2	3	4	**very confident**
2. Get the facts about the benefits of each option	**not at all confident**	0	1	2	3	4	**very confident**
3. Get the facts about the risks, side effects, inconveniences of each option	**not at all confident**	0	1	2	3	4	**very confident**
4. Understand the information enough to be able to make a choice	**not at all confident**	0	1	2	3	4	**very confident**
5. Ask questions without feeling dumb	**not at all confident**	0	1	2	3	4	**very confident**
6. Express my concerns about each option	**not at all confident**	0	1	2	3	4	**very confident**
7. Ask for advice	**not at all confident**	0	1	2	3	4	**very confident**
8. Figure out the option that best suits me	**not at all confident**	0	1	2	3	4	**very confident**
9. Handle unwanted pressure from others in making my choice	**not at all confident**	0	1	2	3	4	**very confident**
10. Let others know what's best for me	**not at all confident**	0	1	2	3	4	**very confident**
11. Delay my decision if I feel I need more time	**not at all confident**	0	1	2	3	4	**very confident**

Reference :

AM O'Connor, Decision Self-Efficacy Scale. © 1995. Available from www.ohri.ca/decisionaid.

2.0 Demographic Information

2.1 In what year were you born? ____ Month ____ Year

2.2 To which ethnic group do you most closely associate yourself?

- ☐ White
- ☐ Black
- ☐ Aboriginal Peoples of North America (e.g. North American Indian, Métis, Inuit)
- ☐ Chinese
- ☐ South Asian (e.g., East Indian, Pakistani, Sri Lankan)
- ☐ Southeast Asian (e.g., Cambodian, Indonesian, Laotian)
- ☐ Filipino
- ☐ Japanese
- ☐ Korean
- ☐ Arab
- ☐ Latin American
- ☐ Other (please specify):_____

2.3 Civil Status:

☐	Married	☐	Divorced	☐	Don't know
☐	Living with someone	☐	Separated	☐	Refuse to answer
☐	Widowed	☐	Single	Other	_____

2.4 Education:

Highest level of education obtained?

☐	Primary	☐	Some University		
☐	Secondary	☐	University		
☐	Some College	☐	Refuse to answer	Other	
☐	College				_____

2.5 Occupation:

Are you presently employed? ☐ Yes ☐ No

☐	Employed	☐	On social assistance	☐	Don't know
☐	Unemployed	☐	On strike or lock-out	☐	Refuse to answer
☐	Student	☐	On unemployment insurance	Other	_____
☐	Work at/from home	☐	Retired		

2.6 Physical activity during leisure time:

How much time do you allow for leisure activities **each day**?

(Examples of leisure time activities: walking for exercise, gardening or yard work, swimming, bicycling, social dance, home exercises, ice hockey, ice skating, rollerblading, jogging or running, golfing, exercise class or aerobics)

☐	Between 0 - 30 minutes	☐	Between 90-120 minutes	☐	Refuse to answer
☐	Between 30 - 60 minutes	☐	More than 120 minutes	☐	Not applicable
☐	Between 60 - 90 minutes	☐	Don't know	Other	_____

2.7 Housing:
How many adults (≥ 18 yrs) living with you? _____
How many teenagers (12 to 17 yrs) living with you? _____
How many children (< 12 yrs) living with you? _____

Residence:
☐ Room ☐ Condominium ☐ Refuse to answer
☐ Apartment ☐ House ☐ Don't know
Other _____

Access (outside):
☐ Stairs ☐ Elevator ☐ Not applicable

2.8 Total income of all members of the household:
☐ Less than $20 000 ☐ $40 000 to $49 999 ☐ Don't know
☐ $20 000 to $29 999 ☐ $50 000 to $99 999 ☐ Refuse to answer
☐ $30 000 to $39 999 ☐ More than $100 000

Financial situation:
I consider myself to be…
☐ Financially comfortable ☐ Poor ☐ Don't know
☐ Sufficient income ☐ Very poor ☐ Refuse to answer

2.9 Television and computer:
How many hours per week do you usually watch television?
☐ Less than 2 hours per week ☐ Between 4 – 6 hours per week ☐ Don't know
☐ Between 2 – 4 hours per week ☐ More than 6 hours per week ☐ Refuse to answer

How many hours per week do you usually use the computer (e.g., internet, e-mails, games)?
☐ Less than 2 hours per week ☐ Between 4 – 6 hours per week ☐ Don't know
☐ Between 2 – 4 hours per week ☐ More than 6 hours per week ☐ Refuse to answer

2.10 Eating habits:
How many meals do you usually eat every day: _____
How many snacks do you usually have every day: _____

WHERE DO YOU usually EAT:
Breakfast?
☐ House ☐ Work ☐ Don't know
☐ Restaurant ☐ Cafeteria ☐ Refuse to answer
☐ Take-out restaurant

Lunch?
☐ House ☐ Work ☐ Don't know
☐ Restaurant ☐ Cafeteria ☐ Refuse to answer
☐ Take-out restaurant

Dinner?

- ☐ House
- ☐ Restaurant
- ☐ Take-out restaurant
- ☐ Work
- ☐ Cafeteria
- ☐ Don't know
- ☐ Refuse to answer

Who is the person who usually does the grocery shopping (check only one)?

- ☐ Me
- ☐ Spouse
- ☐ Kid(s)
- ☐ Parents
- ☐ Employee
- ☐ Don't know
- ☐ Refuse to answer

Who is the person who usually prepares the meals (check only one)?

- ☐ Me
- ☐ Spouse
- ☐ Kid(s)
- ☐ Parents
- ☐ Employee
- ☐ Don't know
- ☐ Refuse to answer

2.11 Would you say that in general your health is:

- ☐ Excellent
- ☐ Very good
- ☐ Good
- ☐ Fair
- ☐ Poor

3.0 Menopause Symptoms

3.1 Which of the following symptoms apply to you at this time? Please, mark the appropriate box for each symptom. For symptoms that do not apply, please mark 'none'.

	Symptoms	None	Mild	Moderate	Severe	Very severe
	Score =	0	1	2	3	4
1	Hot flashes, sweating (episodes of sweating)	☐	☐	☐	☐	☐
2	Heart discomfort (unusual awareness of heart beat, heart skipping, heart racing, tightness)	☐	☐	☐	☐	☐
3	Sleep problems (difficulty falling asleep, difficulty in sleeping through, waking up early)	☐	☐	☐	☐	☐
4	Depressive mood (feeling down, sad, on the verge of tears, lack of drive, mood swings)	☐	☐	☐	☐	☐
5	Irritability (feeling nervous, inner tension, feeling aggressive)	☐	☐	☐	☐	☐
6	Anxiety (inner restlessness, feeling panicky)	☐	☐	☐	☐	☐
7	Physical and mental exhaustion (general decrease in performance, impaired memory, decrease in concentration, forgetfulness)	☐	☐	☐	☐	☐
8	Sexual problems (change in sexual desire, in sexual activity and satisfaction)	☐	☐	☐	☐	☐
9	Bladder problems (difficulty in urinating, increased need to urinate, bladder incontinence)	☐	☐	☐	☐	☐
10	Dryness of vagina or difficulty with sexual intercourse	☐	☐	☐	☐	☐
11	Joint and muscular discomfort (pain in the joints, rheumatoid complaints)	☐	☐	☐	☐	☐

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3.2 Are your menstrual periods (check one for each set of questions below):

☐ regular
☐ irregular
☐ stopped; if yes, for how long?_____
(if stopped, go to Question 3.3)

☐ longer number of days for each period
☐ shorter number of days for each period
☐ no difference in number of days for each period

☐ heavier blood flow
☐ lighter blood flow
☐ no difference in the amount of blood flow

☐ occurring more often than usual (e.g. closer together)
☐ occurring less often than usual (e.g. sometimes feels like you skip a period)
☐ no difference in how often it occurs

☐ more painful
☐ less painful
☐ no difference in the level of pain

3.3 Is there anything you are aware of that could be affecting the pattern of your menstrual periods (e.g. taking hormones, using an IUD, etc.)?

☐ no
☐ yes. If yes, please explain: _____

4.0 Other Health Issues

4.1 Are you experiencing any other health problems that are not necessarily related to menopause that could impact decisions on obtaining a healthy body weight?

_____
_____
_____
_____

Appendix C

File Number: H03-10-07 **Date (mm/dd/yyyy):** 04/14/2011

Université d'Ottawa University of Ottawa
Bureau d'éthique et d'intégrité de la recherche Office of Research Ethics and Integrity

Ethics Approval Notice

Health Sciences and Science REB

Principal Investigator / Supervisor / Co-investigator(s) / Student(s)

First Name	Last Name	Affiliation	Role
Dawn	Stacey	Health Sciences / Nursing	Principal Investigator
Kristi	Adamo	Others / Others	Co-investigator
Martin	Brochu	Others / Others	Co-investigator
Alexandre	Dumas	Health Sciences / Human Kinetics	Co-investigator
Denis	Prud'homme	Health Sciences / Human Kinetics	Co-investigator
Irene	Strychar	Medicine / Medicine	Co-investigator
Deanne	McArthur	Health Sciences / Nursing	Student Researcher

File Number: H03-10-07

Type of Project: Professor

Title: Decisional Needs of Perimenopausal Women for body Weight Changes during Transition to Menopause

Renewal Date (mm/dd/yyyy)	Expiry Date (mm/dd/yyyy)	Approval Type
04/15/2011	04/14/2012	Ia

(Ia: Approval, Ib: Approval for initial stage only)

Special Conditions / Comments:
N/A

550, rue Cumberland 550 Cumberland Street
Ottawa (Ontario) K1N 6N5 Canada Ottawa, Ontario K1N 6N5 Canada
(613) 562-5841 • Téléc./Fax (613) 562-5338
http://www.research.uottawa.ca/ethics/index.html
http://www.recherche.uottawa.ca/deontologie/index.html

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File Number: [redacted]

Date: [redacted]

Université d'Ottawa University of Ottawa

Bureau d'éthique et d'intégrité de la recherche Office of Research Ethics and Integrity

This is to confirm that the University of Ottawa Research Ethics Board identified above, which operates in accordance with the Tri-Council Policy Statement and other applicable laws and regulations in Ontario, has examined and approved the application for ethical approval for the above named research project as of the Ethics Approval Date indicated for the period above and subject to the conditions listed the section above entitled "Special Conditions / Comments".

During the course of the study the protocol may not be modified without prior written approval from the REB except when necessary to remove subjects from immediate endangerment or when the modification(s) pertain to only administrative or logistical components of the study (e.g. change of telephone number). Investigators must also promptly alert the REB of any changes which increase the risk to participant(s), any changes which considerably affect the conduct of the project, all unanticipated and harmful events that occur, and new information that may negatively affect the conduct of the project and safety of the participant(s). Modifications to the project, information/consent documentation, and/or recruitment documentation, should be submitted to this office for approval using the "Modification to research project" form available at: http://www.rgsc.uottawa.ca/ethics/application_ form.asp

Please submit an annual status report to the Protocol Officer 4 weeks before the above-referenced expiry date to either close the file or request a renewal of ethics approval. This document can be found at: http://www.rgsc.uottawa.ca/ethics/application_ form.asp

If you have any questions, please do not hesitate to contact the Ethics Office at extension: [redacted] or by e-mail at: [redacted]

Signature:

[redacted]

Germain Zongo
Protocol Officer for Ethics in Research
For Daniel Lagarec, Chair of the Sciences and Health Sciences REB

[redacted] Cumberland 550 Cumberland Street
Ottawa (Ontario) K1N 6N5 Canada Ottawa, Ontario K1N 6N5 Canada
(613) 562-5387 • Tél/tél: /Fax (613) 562-5328
http://www.research.uottawa.ca/ethics/index.html
http://www.recherche.uottawa.ca/deontologie/index.html

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uOttawa

Information and Consent Form
Women aged 40-65

What do perimenopausal women need when making decisions about managing body weight changes during the transition to menopause?

Principal Researcher:
Dawn Stacey, RN, PhD, CCN(C), School of Nursing, University of Ottawa

Co-Researchers:
Denis Prud'homme MD, MSc, Dean, Faculty of Health Sciences, University of Ottawa
Kristi Adamo, PhD Healthy Active Living and Obesity Research Group, Children's Hospital of Eastern Ontario
Martin Boucha, PhD University of Sherbrooke
Alexandra Dumas, PhD, Associate Professor, Faculty of Health Sciences, University of Ottawa
Irene Strychar, Pt. D. PhD University of Montreal
Deanne McArthur, BNSc. RN, School of Nursing, University of Ottawa

This form is part of a process to get your informed consent to participate in a research study. There are 2 copies, 1 copy for the participant and 1 copy for the researcher. The information presented here explains the research study and what your participation would involve. If you want more information, do not hesitate to ask. Please take the time to read this information and learn about the study.

Why is this research being done?
Women transitioning through menopause are at a higher risk of weight gain. This study is being done to have a better understanding of what women need when making decisions and taking action about managing body weight changes during the transition to menopause. We are interviewing women aged 40-65 years and others (e.g. dietitians, grocery store owners, physical activity facility staff, kinesiologists, primary care practitioners, and practitioners) that influence women making and implementing decisions about achieving and maintaining healthy body weight.

Who funded this study?
This study was funded by Canadian Institutes of Health Research (CIHR) as part of a larger project looking at body weight issues that affect women's health.

What would my participation in this study involve?
If you agree to join this study, you will be asked to participate in a 45 minute interview with a research assistant. The interview will include questions about the

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environment in which you live, the approach you use when making decisions, how confident you feel in these decisions, what you need to be able to make these decisions, and your current activities. Interviews will be audio-recorded to ensure accurate data collection.

What are the risks and inconveniences of participating?
There are no known risks of taking part in this study. Participating in this study will require you to spend approximately 45 minutes with a research assistant to answer some questions. You are not required to answer any questions that make you uncomfortable.

What are the advantages of participating?
We do not think there are any benefits to participants personally. This project has the potential to benefit other women by contributing knowledge on the needs of women when making decisions about body weight changes during the transition through menopause.

What are your rights?
Joining this study is your choice. If you decide to participate, you have the right to ask the researchers questions about this study. You also have the right to withdraw from the study at any time.

What happens with your information?
You will receive a copy of your consent form and a copy will be kept by the researchers. All information collected for this study is confidential. Your interview could be analyzed by a graduate student as part of their thesis. If the results of the study are published, your name will not be associated with the data. Instead, an independent study number will be used. Information collected will be saved for 15 years and then destroyed by shredding any paper files and permanently deleting any electronic files. The University of Ottawa Ethics Board may review your relevant study records, under the supervision of Dawn Stacey's staff, for audit purposes.

What are your costs?
There is no cost to you for participating in this study. In appreciation for your time, upon completion of the interview you will receive a $10 gift certificate.

For more information:
The principal researcher and the research team members are available to answer your questions about the study. If you have questions, please contact Dawn Stacey at [redacted]

If you have questions regarding the ethical conduct of this study, you may contact:
The Protocol Officer for Ethics in Research
University of Ottawa, Tabaret Hall
550 Cumberland Street, Room 159
Ottawa, Ontario K1N 6N5
Tel: (613) 562-5841
Email: ethics@uottawa.ca

What do perimenopausal women need when making decisions about managing body weight changes during the transition to menopause?
Women aged 40-65

Consent to participate in this study – an interview with a research assistant:

1. I have been informed of the nature of the goals of this research study and what is expected of me.
2. My participation in this study is voluntary and I can withdraw from the study at any time.
3. The information collected in this study will be kept confidential and it will be used by the research team for research purposes only. My name will not appear on any publications.
4. I have asked my questions concerning the protocol and I received satisfactory responses.
5. I can obtain more information from the principal investigator, Dawn Stacey RN, PhD, at any time.
6. I have read the attached 2 page information form and I voluntarily agree to participate in this study.

Name (Printed):	Signature:	Date:
_____	_____	_____
Participant		
_____	_____	_____
Investigator/Delegate		

File Number: H03-10-07 **Date (mm/dd/yyyy):** 07/14/2010

Université d'Ottawa University of Ottawa
Service de subventions de recherche et déontologie Research Grants and Ethics Services

Ethics Approval Notice

Health Sciences and Science REB

Principal Investigator / Supervisor / Co-investigator(s) / Student(s)

First Name	Last Name	Affiliation	Role
Dawn	Stacey	Health Sciences / Nursing	Principal Investigator
Kristi	Adamo	CHEO Research Institute	Co-investigator
Martin	Brochu	Éducation physique et sportive-Sherbrooke	Co-investigator
Alexandre	Dumas	Health Sciences / Human Kinetics	Co-investigator
Denis	Prud'homme	Health Sciences / Human Kinetics	Co-investigator
Irene	Strychar	Medicine / Nutrition – Université de Montréal	Co-investigator

File Number: H03-10-07

Type of Project: Professor

Title: Decisional Needs of Perimenopausal Women for body Weight Changes during Transition to Menopause

Approval Date (mm/dd/yyyy)	Expiry Date (mm/dd/yyyy)	Approval Type
04/15/2010	04/14/2011	Ia

(Ia: Approval, Ib: Approval for initial stage only)

Special Conditions / Comments:

Amanda Dresch has been hired as a summer student (2010). She will be involved in recruitment and interviews, as well as administrative duties. A confidentiality agreement has been signed.

550, rue Cumberland 550 Cumberland Street
Ottawa (Ontario) K1N 6N5 Canada Ottawa, Ontario K1N 6N5 Canada
(613) 562-5841 • Téléc./Fax (613) 562-5338
http://www.rges.uottawa.ca http://www.ssrd.uottawa.ca

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