NOTE TO USERS

The Impact of a 10-Week Structured Exercise Class On The Perceptions of Vasomotor Symptoms Experienced By Perimenopausal Women: A Qualitative Collective Case Study

A Thesis
Presented to the
School of Kinesiology
Lakehead University

In Partial Fulfillment
of the Requirements for the
Master of Science Degree
In
Kinesiology,
With specialization in Gerontology

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Your file Votre référence
ISBN: 978-0-494-47128-9
Our file Notre référence
ISBN: 978-0-494-47128-9

Abstract

Menopause is a natural progression in the aging process and signals the end of the woman's reproductive life. Menopause has been associated with the occurrence of a range of symptoms that affect every aspect of the woman's life. One group of symptoms experienced by the majority of mid-life women are hot flashes and nights sweats, referred to in the research community as vasomotor symptoms. The experience of these symptoms is a subjective event, one that is as unique as the women themselves. Vasomotor symptoms may be disruptive in nature and affect the physical, psychological and social aspects of some women's lives. For the women who are negatively affected by this symptom, the usual recourse is to go on hormone replacement therapy (HRT). However, negative side effects of HRT have been widely publicized, causing women to seek other alternatives, including cardiovascular exercise.

This study provided the opportunity to explore how, through a structured exercise class, cardiovascular exercise affects the experience of vasomotor symptoms perceived by a group of perimenopausal women. Through a collective case study utilizing mixed methods, the experiences of four women were followed over the course of ten weeks. During this time, the women undertook a structured exercise class that was held for one hour, three times per week at a fitness facility.

The results of this study are promising. All four of the participants in this study experienced a decrease in the frequency and/or the severity of their vasomotor symptoms. There were also other benefits of participating in the study that emerged from the data. The women reported improvements in their self-esteem and self-confidence. They also developed a sense of belonging through experiencing this class together and drew upon each other as a source of motivation.

Acknowledgements

The expression "it takes a community to raise a child" describes my sentiments when I think of my journey and all who helped out along the way - for there have been many.

First and foremost, I would like to thank my thesis supervisor, Dr. Joey Farrell and my two fabulous committee members, Dr. Mary Lou Kelley and Dr. Diane Walker. Without these three women, I would still be wrestling with my conscious while travelling down the wrong road in the opposite direction. To Dr. Farrell, thank you for accepting me as your student and letting me do what I wanted to do, how I wanted to do it. Thank you for your patience, your support and your willingness to be a back seat driver. To Dr. Mary Lou Kelley, what can I say? If it wasn't for your knowledge and insight, the doors to the interpretive paradigm would still be marked with a "do not enter" sign. Thank you for turning on the light and always being there for me to answer the questions that no one else could answer. To Dr. Diane Walker, thank you for squeezing me in to your already filled-to-capacity life. Thank you for your guidance, insight and your empathetic ear as well as introducing me to Calico Coffee House.

A huge thank you to my husband and my son, for without their love, encouragement and support, I would surely be lost. Words cannot express how much you both mean to me. Thank you for giving me the time and space I needed and for putting up with my insane schedule, not to mention my mood swings! Perhaps now we can use the dining room table for more than a work station and our conversations can center on more than just menopause and hot flashes.

I owe a great deal to the women who took part in my study for without them this research project would not exist. I feel both honoured and privileged that they chose to be participants in my study. They were a constant source of inspiration to me and I admire their sense of devotion and commitment to sticking it out to the end. Thank you very much ladies. Thanks to Lisa, the motivator, the leader, the glue that held the exercise class together. Thank you for coming to my rescue. I can only say that those whose paths you cross, including mine are truly blessed.

I would also be remiss if I didn't acknowledge those people who played a minor, yet significant role over the past three years. Thank you to my mom – yes I've finally finished. Thanks to all of my clients whose understanding and support I truly appreciate. A special thank you to Taina Chahal, Laure Paquette, and Will Wilson for sharing their knowledge and experience in the academic world.

For the things we have to learn
before we can do them,
we learn by doing them.
- Aristotle

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Chapter One – Introduction

Over the last three decades, the breadth of research relating to women's health and aging has increased. Menopause is a natural progression in the aging process and signals the end of the woman's reproductive life. Menopause has been associated with the occurrence of a range of symptoms that affect every aspect of the woman's life. One group of symptoms experienced by the majority of mid-life women are hot flashes and nights sweats, referred to in the research community as vasomotor symptoms. Experience of these symptoms is a subjective event, the degree of discomfort and distress felt are as unique as the women themselves. Over three-quarters of menopausal women will experience vasomotor symptoms; forty percent of these women find the symptom so unbearable that they seek out medical attention (Solimon, 2005).

Researchers have explored the efficacy of various interventions, both traditional and non-traditional, that have been presented to help women cope with the experience of vasomotor symptoms. Physicians have commonly prescribed hormone replacement therapy (HRT) to provide relief from vasomotor symptoms. However, the use of HRT has come under scrutiny in the past decade due primarily to the publication of the Women's Health Initiative (WHI) in 2002. The results of the WHI indicated that there was no protective effect on the prevention of cardiovascular disease, as previously suggested and also determined that there was an increased risk in both thromboembolic disease as well as breast cancer (Rossouw, Anderson, Prentice, LaCroix, Kooperberg & Stefanick, 2002). In response to the demand for options to HRT, researchers from both the medical and non-medical community have focused attention on developing and bringing awareness to alternative therapies. Participating in physical activity has been suggested as one such intervention. The purpose of this study is to understand how participating in an exercise class affects vasomotor symptoms.

Twists of Fate

As far back as I can remember I have always been involved in some sort of physical activity. As a young girl, I spent much of my formative years enjoying the virtues of growing up in "the country". My sisters and I used our natural environment, along with our vivid imaginations, to play whatever games we could. We were also involved in the sport of figure skating in which we participated in year-round. As time passed, the allure of playing imaginative games as well as participating in figure skating faded as life as a high school student took over. My interests then turned to enhancing my personal life and my choice of activities reflected that. I joined the track and field club and tried my hand at middle distance running. When I graduated from high school and became a productive member of society, I joined a gym for purely selfish reasons – to look good and stay in shape. One thing lead to another and through a twist of fate, I began down the path of teaching others to learn how to exercise. Over the course of my career, I have had the honour and privilege of working with a variety of clientele from whom I have learned skills that could never be taught at school. It was about five years ago that, through another twist of fate, the demographics of my clientele changed and I began to work more and more with women in the middle decades of their life - i.e. the "baby boomers". Without exception, their concerns surrounded aging gracefully and in the best possible shape they could. I unconsciously took an interest in their concerns as I too was approaching middle age. Through conversations with these particular women, the question emerged: "Despite our best efforts, why as we age do we gain weight around our midsections?" Curiosity piqued, I needed and wanted to find out more; hence the return to graduate school.

After much deliberation and realization that that particular topic was best left to doctoral research, I went back through all of the articles I had gathered. Hidden amongst them was one authored by Hammar, Berg and Lindgren (1990) entitled "Does physical exercise influence the frequency of postmenopausal hot flashes?" It was through this article that the idea of researching the relationship

between vasomotor symptoms and exercise grew. As I began gathering more articles, I also began to realize how revolutionary Hammar et al.'s (1990) particular article was. Through my background research I learned that the usual course of action for management of menopausal symptoms (not just hot flashes) lay in the prescription of hormone replacement therapy. But, as research progressed, it was discovered that HRT, thought to be the panacea of symptom management was not without life-threatening consequences. Enter exercise. Here lay a natural solution to a natural event without the negative side effects. My thoughts then turned to methods and trying to figure out the best way to approach researching this 'problem'.

I always wanted to do an exercise intervention because I strongly believed that this would be the best way to find out first-hand how beneficial exercise could be. In my discipline, Kinesiology, this best fit a randomized controlled trial (RCT) method. And so I began the background process of applying what had already been done to what I wanted to do. I remember being in such conflict during this time. One part of me wanted to do the RCT but there was this tiny voice, a niggling feeling, telling me that I was missing something. Something was just not right. I have always believed that no two people have the same thoughts, feelings or beliefs about a similar or even shared experience but I could not explore that completely doing a RCT.

During this time, through another twist of fate, I had taken an elective course in Gerontology. One of the requirements of this course was to write a paper looking at my thesis topic from perspectives other than the one I was currently using (i.e. biological). Writing this paper was a challenging and thought-provoking process and at its completion, I came to the realization that my epistemological and ontological beliefs lay in the qualitative paradigm. The proverbial light went off. Now I knew what I was missing. I was excited at the prospect of approaching my research from a very different perspective,

one that allowed for me to incorporate both the objective and subjective experience of menopausal symptoms. What follows is my initial foray into the world of qualitative research.

Definition of Terms

Menopause

Menopause, unless surgically induced is a natural part of the aging process. Over the course of time production of specific reproductive hormones gradually decreases until menstruation permanently ceases. A woman is clinically defined to be in menopause when she has ceased menstruation completely for one full year. Menopause can occur either naturally via aging or artificially through surgical or medical means. The average age a woman enters menopause is 52, although this can vary from 48 to 55 years (Freedman, 2001).

Perimenopause

The transitional period from regular monthly menstruation to cessation of menstruation is referred to as the perimenopause. The perimenopause can last from two to five years and is characterized by fluctuating hormonal levels that result in a myriad of symptoms that affect the physical, psychological, functional, spiritual and social aspects of the woman's life (Miller & Ashar, 2004; Reame, 2000). The most common physical symptoms reported are hot flashes and/or night sweats as well as vaginal dryness. Other physical symptoms that have been reported include headaches, backaches, dizzy spells, constipation, gas, bloating, lack of appetite, lack of energy, and loss of libido. Depression, mood swings, poor concentration and memory loss are the most commonly reported psychologically based symptoms (Dennerstein, Smith, Morse, Burger, Green, Hopper, et al., 1993).

Unlike menopause with its definitive biological markers, the perimenopause is much more difficult to diagnose. There is no definitive point in time when a woman can know with certainty that she has started the transition into menopause. Hormonal variability symbolizes this transitional period

where the pituitary gland is stimulated to produce more follicle stimulating hormone (FSH) to, in turn, attempt to stimulate the remaining follicles to develop (Soares & Cohen, 2001). Daily variations in FSH levels make it very difficult for a positive diagnosis to be made, even through laboratory tests. This change in hormones is without a doubt not noticeable to the woman, but what is most often noticed by many women are changes in menstrual cycle length (e.g. shortened or skipped cycles) and/or changes in menstrual flow (Miller & Ashar, 2004).

Vasomotor Symptoms

Hot flashes and night sweats are referred to as vasomotor symptoms. Hot flashes are characterized by a sudden sensation of heat, flushing, and clamminess that starts in the head and neck area and then passes over the entire body. The sensation is more apparent in the head, neck and upper torso. It may be preceded by a headache and can be accompanied by palpitations, anxiety, perspiration and red blotchiness of the skin. The hot flash is usually followed by chills or feelings of cold. The frequency and duration of a hot flash varies, but usually lasts one to five minutes. Night sweats are physiologically the same as hot flashes but occur with drenching perspiration during sleep. Due to their disruptive nature, they usually interfere with sleep leading to insomnia and chronic fatigue (Berendsen, 2000; Fitzpatrick & Santen, 2002; Frackiewicz & Cutler, 2000). Freedman (2001) also notes that hot flashes are often accompanied with sweating in the "face, head, neck, and chest, but rarely in the lower body" (p. 453).

Chapter Two – Review of Literature

Effects of Exercise on Menopausal Symptoms

The benefits of exercise in general have been widely reported and promoted by governments and public health agencies worldwide. Exercise has been shown to be especially important to women who are approaching or have reached menopause (Burghardt, 1999; Bushman & Young, 2005; Kemmler, Lauber, Weineck, Hensen, Kalender & Engelke, 2004; Sternfeld & Marcus, 2000). Major health concerns centre around cardiovascular disease, osteoporosis and other chronic diseases, especially diabetes and certain types of cancer (Hammar, Brynhildsen, Wyon, Nedstrand & Notelovitz, 1995). Due to the natural decline in estrogen production, the protective benefits of estrogen on the coronary system are decreased. The low amount of estrogen coupled with natural aging processes such as increasing lipids, blood pressure and fasting insulin levels, lead to an increase in the risk of developing coronary heart disease (Sternfeld & Marcus, 2000). Osteoporosis, or loss of bone mass and density, has also been attributed to the lack of estrogen in menopausal women. The loss of bone leads to an increased risk of bone fractures, especially those of the hip (Burghardt, 1999). The increased risks of diabetes, breast cancer, endometrial cancer, and colon cancer have been linked to increases in body mass index and adiposity, commonly seen in menopausal women. Researchers have attributed the preceding risks more to inactivity and dietary habits than to hormonal variations (Hammar et al., 1995; Sternfeld & Marcus, 2000).

Exercise can be beneficial to offset the risks associated with perimenopause and menopause in several ways. Exercise has been shown to decrease the incidence of coronary heart disease through lowering the risk factors associated with heart disease (Bushman & Young, 2005). Specifically, exercise decreases adiposity, lowers blood pressure, increases HDL cholesterol, lowers LDL cholesterol, decreases body mass index and improves cardiovascular functioning. The factors that lower the risk of heart

disease can also be applied to lowering the risk of breast, endometrial and colon cancer. Exercise can also promote increased peak bone mass, especially if it is undertaken at a younger age, and decreases the rate of demineralization. Exercise improves balance which is a key element in preventing falls thereby lowering the risk of bone fractures. Exercise helps to regulate glucose tolerance and insulin sensitivity thereby decreasing the risk of developing diabetes.

Vasomotor Symptoms Explained

While the occurrence of vasomotor symptoms is commonly associated with perimenopausal and menopausal women, their exact cause is not fully known. While it is theorized that vasomotor symptoms are linked to one or a combination of hormone withdrawals or surges, the isolation of the exact hormone or hormones remains unknown. Leutinizing hormone (LH), FSH, adrenocorticotropic hormone (ACTH) and growth hormone have all been associated with the vasomotor symptoms mechanism. The most accepted theory links vasomotor symptoms to the withdrawal of estrogen (Rebar & Spitzer, 1987; Whiteman, Staropoli, Benedict, Borgeest & Flaws, 2003).

The body's normal core temperature range, the thermoregulatory zone is maintained by the hypothalamus. Vasomotor symptoms are believed to be triggered by a sudden downward shift in body core temperature sensed by the medial preoptic area of the hypothalamus. In order to establish a new set point, the hypothalamus compensates by suddenly increasing the body core temperature via mechanisms of heat loss i.e. perspiration and vasodilation (Shanafelt, Barton, Adjei & Loprinzi, 2002).

There are several neuroendocrine pathways that are involved in thermoregulation including norepinephrine, estrogen, testosterone and endorphins. Of these, norepinephrine is believed to be the primary neurotransmitter responsible for lowering the thermoregulatory set point and triggering vasomotor symptoms (Freedman, 2001; Shanafelt et al., 2002). One of the roles of estrogen is to mediate brain neurotransmitters, such as endorphins, a type of hypothalamic opioid. Endorphins, along

with catecholestrogen, estrogen and testosterone inhibit the production and release of norepinephrine which inhibits the symptoms. Vasomotor symptoms will occur if a dysfunction exists along any one or a combination of these pathways.

Approaches to Treat Vasomotor Symptoms

Since the 1950s, HRT has been commonly prescribed to provide relief from vasomotor symptoms (Kupperman, Wetchler & Blatt, 1959). However, the use of HRT has come under scrutiny in the past decade due primarily to the publication of the WHI in 2002. The results of the WHI indicated that there was no protective effect on the prevention of cardiovascular disease, as previously suggested and also determined that there was an increased risk in both thromboembolic disease as well as breast cancer (Rossouw, et al., 2002). Due to this new evidence, the widespread use of HRT is being questioned not only by the medical community but by women themselves. In response, agencies such as the Society of Obstetricians and Gynaecologists of Canada (SOGC) have updated their clinical practice guidelines surrounding prescription and use of HRT. Furthermore, researchers from both the medical and non-medical community have focused attention on developing and bringing awareness to alternative therapies. Now women are becoming more aware that there are pharmaceutical choices other than HRT (e.g. raloxifene, gapapentin, clonidine) as well as various alternative therapies such as dietary changes (e.g. soy products), herbal remedies (e.g. black cohosh, dong quai, evening primrose), mind awareness (meditation, t'ai chi), and exercise.

The Effects of Exercise on Vasomotor Symptoms

The link between exercise and vasomotor symptoms has not yet been firmly established. It has been suggested that exercise stabilizes the thermoregulatory center, by increasing the amount of specific neurotransmitters that block the mechanism involved in vasomotor symptoms (Berendsen, 2000). As previously stated, endorphins, along with other neurotransmitters, inhibit the production and

release of norephinephrine thereby inhibiting vasomotor symptoms. One group of these hypothalamic opioids is the β-endorphins which are known to be released through cardiovascular exercise (Berendsen, 2000; Tepper, Neri, Kaufman, Schoenfeld & Ovadia, 1987). It has been suggested that exercise stabilizes the thermoregulatory center by increasing the amount of ß-endorphins produced by the hypothalamus (Harber, Sutton, MacDougall, Woolever & Bhavnani, 1997). In this way, it has been suggested that exercise can help alleviate vasomotor symptoms.

Review of Research

Research conducted about perimenopause, menopause and vasomotor symptoms has been conducted from both quantitative as well as qualitative paradigms. Quantitative studies attempt to explain and predict the specific and measurable aspects of vasomotor symptoms while qualitative studies introduce subjectivity and the lived experience of the participants. Both types of studies have yielded results that have helped shape knowledge and understanding of menopause in general and in particular, symptom-management. Research measuring the impact of exercise on vasomotor symptoms will be reviewed first followed by research that explores the experience of menopause, exercise and vasomotor symptoms.

Research Measuring the Impact of Exercise on Vasomotor Symptoms

Exploring cardiovascular exercise as a means of alleviating vasomotor symptoms began with a study published by Hammar et al. (1990). The study, conducted in Sweden utilized a self-administered questionnaire that was distributed to post-menopausal women from both the general population, the control group (n=1,246), as well as to active members of a gym, the physically-active group (n=142). Once eligibility requirements were met, the sample sizes were 634 women in the control group and 79 in the physically-active group. Results obtained indicated that 278 of the 634 (43.8%) women in the control group and 17 of the 79 (21.5%) experienced moderate or severe hot flashes ($p<0.001$, chi-square

test). When the groups were separated according to number of years after menopause, it was found that among women of similar postmenopausal age, those who were not physically active were more apt to experience moderate and severe vasomotor symptoms than those who were physically active. Although the analyses and methods used in this study were basic, the issues it raised brought awareness to an avenue of research that had previously not been considered.

Since the 1990s, several other studies have examined the relationship between vasomotor symptoms and fitness during leisure time or structured exercise (Aiello, Yasui, Tworoger, Ulrich, Irwin, Bowen, et al., 2004; Ivarsson, Spetz, & Hammar, 1998; Li, S. & Holm, 2003; Li, Samsioe, Borgfeldt, Lidfeldt, Agardh & Nerbrand, 2003; Lindh-Astrand, Nedstrand, Wyon & Hammar, 2004; Thurston, Joffe, Soares & Harlow, 2006; Wilbur, Dan, Hedricks & Holm, 1990; Wilbur, Miller, McDevitt, Wang & Miller, 2005). With the exception of three studies by Aiello et al. (2004), Lindh-Astrand et al. (2004), and Wilbur et al. (2005), the study design most frequently employed was a cross-sectional design. The three aforementioned studies employed an exercise intervention. As I also used an exercise intervention for my research, I will review these three articles in depth.

Studies that Employed an Exercise Intervention

It should be noted that the incidence of frequency and/or severity of vasomotor symptoms was not the main focus of the three studies that employed a randomized controlled trial. Instead vasomotor symptom measurement was part of an inventory of symptoms that were being studied. Each study employed different methodologies and arrived at different conclusions. Lindh-Astrand et al.'s (2004) study was conducted on a small sample size (N=75), whereas the sample sizes in Aiello et al.'s (2004) and Wilbur et al.'s (2005) were much larger (N=173 and N=163, respectively). The participants in all three studies were randomly assigned to either a control group or an exercise group. The participants in Lindh-Astrand et al.'s (2004) study were also assigned to a third group that was prescribed oestradiol

therapy. The actual sample size assigned to the exercise group in these three studies was n=15 (Lindh-Astrand et al., 2004), n= 87 (Aiello, et al., 2004), and n= 97 (Wilbur et al., 2005).

The length of the intervention was also markedly different between the three studies ranging from 24 weeks (Wilbur et al., 2005), to 36 weeks (Lindh-Astrand et al., 2004), to one year (Aiello et al., 2004). Participants of Lindh-Astrand et al.'s (2004) study were at least six months postmenopausal, age range from 48-63 years and sedentary. No mention was reported regarding use of HRT. Sedentary, in this study, was defined as less than one hour of regular exercise per week. The participants of Aiello et al.'s (2004) study were postmenopausal, age range from 50-75 years, not taking HRT, sedentary and non-smokers. Sedentary, in this study, was defined as less than 60 minutes per week of moderate-to-vigorous recreational activity as well as a maximal oxygen consumption of less than 25.0ml/kg/min. Participants in Wilbur et al.'s (2005) study were comprised of premenopausal, perimenopausal and postmenopausal women, age range from 45-65 years, not taking HRT, and sedentary. Sedentary, in this study, was defined as "not participating in physical conditioning or a sport for 20 minutes or more per session, two or more times per week, during the preceding 6 months" (Wilbur et al., 2005, p. 167).

The type of intervention varied between the three studies. Participants in Lindh-Astrand's et al.'s (2004) research took part in a 60-minute moderate intensity aerobics class and were required to attend a minimum of twice per week for twelve weeks. They were also required to spend a minimum of one more hour of exercise on their own. The researchers do not provide a complete description of the details of the actual aerobics class except to state that there was a five-minute warm up. No details were provided as to the intensity level the women were exercising at. After the initial twelve weeks, the participants were no longer monitored but were given guidelines and told to continue to exercise on their own. A follow up appointment occurred at 36 weeks. In Wilbur et al.'s (2005) study, the intervention was a home-based moderate intensity walking program. Each participant was required to

walk four times per week starting at 20 minutes and increasing to 30 minutes after the first four weeks. Maximal heart rate was determined from an actual maximal aerobic test. Each participant was prescribed a personal exercise regime based on the results from that test. She was also instructed to exercise within 50%-74% of her maximal heart rate which was recorded and stored via a heart rate monitor. A member of the research team met to briefly interview each participant bi-weekly as well as to transfer the heart rate monitor data to a computer. The participants in Aiello et al.'s (2004) study also started with a moderate intensity monitored program, however, the mode of the intervention was a treadmill or stationary cycle. For the first three months, participants were required to attend the facility for three sessions per week and exercised an additional two days per week at home. From months four to twelve, the participants were required to attend one session per week at the facility and exercise four times per week on their own. Adherence to the home exercise sessions was monitored through the use of a self-recorded exercise log.

Of the three studies that included an exercise intervention, only one found that the group who exercised reported a decrease in the number of hot flashes (Lindh-Astrand et al., 2004). Lindh-Astrand et al.'s (2004) analysis showed that there was a 50% decrease in the mean number of hot flashes experienced by the women who completed the entire 36-week study. However, this result is not statistically significant. This is due to the fact that of the 15 women who started the intervention, only 5 continued to exercise for the entire 36-week period. What was statistically significant was the decrease in the severity of the hot flashes of these 5 women (ANOVA, p=0.041). What these results indicate is that for these women, exercise was successful in ameliorating the frequency and severity of hot flashes. Lindh-Astrand et al.'s (2004) study was also the only one that incorporated daily recording of hot flashes.

the three longitudinal studies previously reviewed, the results are mixed with respect to determining whether a positive relationship exists between exercise and vasomotor symptoms.

Research Exploring the Experience of Menopause, Exercise and Vasomotor Symptoms

There has been little research conducted on the experience of menopause, exercise and vasomotor symptoms. The majority of research published on this topic has focused on understanding or identifying and describing the expectations, meanings and experiences of menopause (Banister, 2000; Bertero, 2003; George, 2002; Winterich & Umberson, 1999). There were two studies that included an exercise component as a main focus of inquiry (Jeng, Yang, Chang & Tsao, 2004; Parry & Shaw, 1999). These two studies are described in detail below.

Parry and Shaw (1999) examined the role of leisure in the experiences of five menopausal women. The researchers adopted a feminist framework to conduct their research. They conducted in-depth, semi-structured interviews with five women who were experiencing menopause. Purposive sampling procedures were used to select women from the alumni of a Southern Ontario university. The only criteria the women had to meet were that they were between 45 and 55 years of age and lived in the local vicinity of the university. Each woman was interviewed in her home. The researchers followed a protocol with which to conduct the interview. Participants were asked open-ended questions regarding the experience of menopause and midlife, the experience of leisure and any influences leisure may have on the experience of menopause. Data was analyzed using the constant comparative method. Each interview was first analyzed using open coding, followed by axial coding in order to compare categories and develop themes. As is consistent with the constant comparative method, data was analyzed after the initial interview and at the same time that subsequent interviews were conducted. Each participant was given a copy of her transcript to review and provide the researchers with feedback with respect to omissions or further comments. Two main themes emerged from the

data analysis. The first main theme related to the association between menopause and midlife. From this main theme, two subthemes emerged. The first related to the difficulties the women had separating emotional challenges of menopause from those of midlife. The other subtheme related to the women's awareness of their own aging. The second main theme that emerged from the data was the benefits that leisure had on the experience of menopause and midlife. Three subthemes also emerged and included improved physical and emotional well-being, an improved sense of familiarity and security and improvement in self-attitude. The researchers found that all the women in the study had a different and unique experience of menopause. Although some of the woman experienced common symptoms, each woman's experience of that symptom was unique. The same conclusions arose with respect to the experience of leisure. Although all the women had incorporated leisure in their lives, what they chose and why they chose to do it varied. Leisure activities, in the eyes of the participants ranged from reading to baking and gardening to exercising. All women indicated that they incorporated some type of physical activity in their leisure time. Furthermore, all women felt that the leisure activities they pursued exerted a positive effect on their lives and stated that physically active leisure improved their health and well-being.

Jeng et al. (2004) studied the experiences of menopausal women who did not exercise regularly before menopause but began to exercise regularly after menopause. The study was conducted in Taiwan on 12 menopausal Taiwanese women. The approach used in this study was a grounded theory research design. As with Parry and Shaw's (1999) study, the researchers used purposive sampling to select the participants. There were four criteria the participants had to meet. First, the women had to have been in menopause for more than one year but less than five years. Second, the women had not regularly exercised before menopause but now did and had been doing so for at least six months. Third, the women had no muscular or bone diseases that restrained their activities. Fourth, the women had to be willing to share their exercise experiences and agree to have their interview recorded. The initial

interview followed a semi-structured format but, in keeping with the tenets of grounded theory, questions were added to the follow-up interview to clarify information gathered. As with Parry and Shaw (1999), data analysis was conducted by the constant comparative method. The authors generated a theoretical framework from their analysis. The core category identified from the data was referred to as 'perceiving continuous power'. As the authors state, "every participating woman perceived that her body and mind were empowered with continuous power" (Jeng et al., 2004, p.450). Several subcategories were identified including "overcoming the initial discomfort, experiencing benefits to body and mind, and broadening" (Jeng et al., 2004, p.450). "Awareness of health crisis" was a category that was identified in response to the women confronting the realities of aging. Once the women accepted the health issues they identified with aging, they decided to overcome these issues and began to regularly exercise. In order to begin exercising regularly, they underwent a process of "self-evaluation, seeking and fitting and comparing" (Jeng et al., 2004, p.451). It was through this process that the women made choices as to what type of exercise interested and suited them. Once the women began to exercise regularly, they experienced improvements in all facets of their life, a process which the authors referred to as "health becoming". The authors found that the women in their study were able to have an optimistic view of their lives as well as themselves in that they were able to "enjoy physical and mental happiness that comes with active exercise" (Jeng et al., 2004, p.453).

Although these two studies considered exercise, they did not include specific recording or monitoring of vasomotor symptoms. Rather the focus was on the experience of exercise and how it impacted the participants' lives. One participant in the study conducted by Parry and Shaw (1999) made reference to how exercise relieved the "irritability associated with hot flashes" (p.211). Other than this one reference, no mention was made of how exercise affected vasomotor symptoms.

The Need for Research Exploring Exercise and the Experience of Vasomotor Symptoms

After reviewing the research conducted to date, it became evident that the knowledge of how exercise affects the experience of vasomotor symptoms is very limited. Various agencies recognize and support cardiovascular exercise as an alternative therapy. The North American Menopause Society (NAMS), the American College of Sports Medicine (ACSM) and the SOGC have published position stands that recommend exercise to women experiencing mild to moderate vasomotor symptoms. As research into the efficacy of exercise is in the early stages of development, additional studies are needed to expand and further explore this line of inquiry. This study contributes to meeting this need by responding to the following research question: How does participating in a 10-week structured exercise class impact the experience of vasomotor symptoms perceived by a group of perimenopausal women?

Chapter Three – Research Method

The method I chose for this research was a qualitative collective case study using mixed methods. Qualitative research is concerned with understanding and exploring the subjective experience of people and is conducted when a detail-rich and holistic account of the experience is sought. It necessitates conversation, observation, appreciation, and introspection. Given my beliefs as well as the nature and purpose of my research and the question I am asking, I believe that qualitative research is the most appropriate choice. The collective case study investigates a number of cases with some feature in common, the feature in this study being the experience of vasomotor symptoms. The main strength in the case study approach lies in the fact that it offers a means of studying multiple variables that could potentially impact multifaceted phenomena. It also provides insights and clarifies meanings surrounding the case evidenced by the richness of the data collected (Merriam, 1988; Robson, 1993; Stake, 2000). Merriam (1988) describes three features of a case study that influenced my decision to use this method. I have applied these features to my study which are outlined below in Table 3.1.

Table 3.1 Features of Case Studies and their Applicability to this Study.

Feature	Applicability to this Study
Focus on the particular, whether that be an event, situation or phenomenon	The focus of this research is on understanding how participating in an exercise class impacts the experiences of vasomotor symptoms
Results in a thorough and complete description of what is being studied	This research will result in a thorough and complete description of the participants' experiences of vasomotor symptoms as they participate in an exercise class
Lead the researcher to uncover new meanings of the phenomenon, broaden both the researchers' and the readers' experience of the phenomenon or confirm what is already known about the phenomenon	This research will uncover new meanings of how participating in an exercise class affects the experiences of vasomotor symptoms. In the process, this study will also broaden both mine and the readers' experiences of this phenomenon.

Choosing the mixed-methods approach "combines the rigor and precision of experimental, quasi-experimental, or correlational designs and quantitative data with the depth and understanding of qualitative methods and data" (Rudestam & Newton, 2007, p.51). Qualitative data collection procedures were used to develop an understanding of how the experience of vasomotor symptoms intertwines with the experience of participating in an exercise class. Quantitative data collection procedures were followed to document any differences in vasomotor symptoms between the start to the end of the study.

Selection of Participants

Sampling Strategy

The sampling strategy used in this research was purposeful sampling. In purposeful sampling, the researcher selects participants and sites for the study because they can "inform an understanding of the research problem and central phenomenon of the study" (Creswell, 2007, p. 125). Posters outlining the nature and details of the study were distributed to individuals I personally knew (Appendix A). In turn, these individuals either put up the poster at their workplace or distributed the poster to individuals they knew. Notice of my research was also given through an audio-taped interview I did with the host of a local radio show. Through these methods, I was contacted by women who were interested in participating in the study either via telephone or e-mail.

I selected the participants based on two strategies of purposeful sampling, criterion selection and maximum variation selection. In criterion selection, participants are selected based on certain common characteristics that are important to provide a framework for the study. In maximum variation selection, participants are selected to represent diverse perspectives. Table 3.2 outlines the common characteristics as well as the variations among the participants.

Table 3.2 Common Characteristics and Variations among Research Participants

Common Characteristics	Variations
Perimenopausal, non smoker, not taking HRT	Age, Parity, Marital status
Experiencing vasomotor symptoms	Menstrual history, Symptom experience (length, frequency)
Currently sedentary, able to attend a minimum of 80% of exercise classes	Education, Occupation

I was contacted by twelve women who expressed an interest in participating in my study. Of these women, I determined that two were ineligible to take part in the study because one of the women was a smoker and the other was taking blood pressure medication. The remaining ten were each sent a Pre-Screening Questionnaire, a Physical Activity and Readiness Questionnaire (PAR-Q), and a General Health Questionnaire along with instructions for completion and return (Appendix B, C and D). A further two women declined to continue any further into the study, leaving eight eligible women remaining.

Limitations

Four of the eight women who started the study dropped out over the course of the 10 weeks. While the women were contacted to discuss their withdrawal, a formal interview to follow up with the participants was not conducted because it fell outside the scope of the purpose of this research.

At first glance, it would appear that a 50% drop out rate is high, however it is not uncommon. As Dishman (2001) notes, on average, half of all adults who begin an exercise program will drop out within the first few months. The reasons the participants withdrew from the study are as follows. The first participant to withdraw from the study did so after the first week because her son's baseball games coincided with the time scheduled for the exercise class. The second participant withdrew after the fourth week because her work required her to attend out of town for the majority of the remaining classes. The third participant, who was self employed withdrew after the sixth week because of scheduling conflicts with her employees. The fourth participant withdrew after the eighth week

because of a combination of factors including care for her family, work issues and the scheduled time of the class was no longer convenient for her.

Data Collection

In keeping with the tenets of qualitative research, specifically the case study method, I used multiple forms of data collection, in particular interviews, a questionnaire, a self-reported journal as well as a self-reported symptom diary.

Interviews

There were two sets of interviews, one conducted prior to beginning the exercise intervention and the other conducted after the exercise intervention was completed. The interviews followed an informal, semi-structured format and were grouped into general concepts (Appendix E and F). General concepts of the initial interview were those related to aging, menopause, exercise, experience of hot flashes, experience of night sweats and anticipated benefits of participating in the study. The general concepts of the final interview were related to aging, general experiences over the course of the study period, experience of symptoms, experience of participating in the study, motivation and scheduling adjustments, and impact of the study on exercise habits. Each interview was audio-taped and followed a list of questions designed to lead the conversation. The sites for both sets of interviews were set at mutually convenient times and locations. The initial interview occurred over the period of April 8, 2008 to April 15, 2008. For the initial interview, four participants were interviewed at their residences, two were interviewed at a private office at my workplace, one was interviewed in her office at her workplace and the other was interviewed at a local coffee shop. Interviews ranged in length from twenty to forty minutes and were transcribed by myself immediately afterwards, allowing me the opportunity to refine the interview guide. The final interview occurred over the period of July 8, 2008 to July 15, 2008. For the final interview, three of the women were interviewed at a private office at my workplace and the

other was interviewed at her residence. Interviews ranged in length from twenty to thirty minutes and were also transcribed immediately after.

Questionnaire: The Women's Health Assessment Scale (WHAS)

The WHAS was administered to each participant prior to commencing both the initial and final interviews. The WHAS was developed by Li, Holm, Gulanick, Lanuza and Penckofer (1999) (Appendix G). Face and content validity for the WHAS was established by an expert panel. Internal validity was established by a Cronbach's alpha value of .94 for frequency of symptoms and .91 for distress of symptoms. The WHAS consists of 50 items that measure vasomotor, psychosomatic, menstrual and sexual dimensions of perimenopause. It is a self-administered questionnaire in which frequency and distress of each symptom is assessed.

Personal Documents: Journals and Diaries

Each participant was given a self-reported journal and a self-reported symptom diary and was asked to record in them daily (Appendix H and I). The self-reported symptom diary served as a medium to record the frequency, intensity and occurrence of vasomotor symptoms. The self-reported journal afforded the participant the opportunity to write about her experiences over the course of the study. Individualized participant journals and symptom diaries were handed out to each participant by me on the first day of the exercise class. Instructions for use were given verbally to the group. Written instructions were also placed on the inside covers of the journal and symptom diary. The participants were also asked to record the time and type of any physical activity she participated in outside of the exercise class. Two of the participants who were not able to attend the first class were later met by myself and hand-delivered their journals and symptom diaries. They were also given the same verbal and written instructions. The journals and symptom diaries were collected either by me or by a designate at intervals throughout the study period. To ensure confidentiality, on occasions when the

journals and symptom diaries were not collected by me, the participants were asked to place these items in a sealed envelope and were hand-delivered to me by the designate. The journals and symptom diaries were then photocopied by myself and returned to the participants by either myself or the designate in the same manner.

Exercise Intervention

The exercise intervention consisted of a structured exercise class which only the study participants took part in. It was lead by a qualified and experienced fitness instructor who was certified through a Canadian recognized agency. The class was offered at no expense to the participants. The site for all but two of the exercise classes was the Aerobics Studio at the Lakehead University Hangar. Due to a scheduled event at the Lakehead University Hangar, two classes had to be held outside at which time the participants met with the instructor and went for a walk on the recreation trail between Lakehead University and Confederation College. The length of each class was a maximum of 60 minutes and was offered three times per week for ten weeks. The classes occurred on Monday, Wednesday and Friday nights and began April 21, 2008 and ended on June 27, 2008. There were a total of 29 classes that took place as there was no class on Victoria Day Monday. All classes were scheduled from 7:00p.m. to 8:00p.m. At the end of week three, after consultation with the participants and the instructor, it was agreed that the Friday class start time would be changed to 5:00p.m.

The instructor was given a journal in which to record the details of each exercise class. The format of each class remained the same in that there was always at least 45 minutes of a cardiovascular portion. The type of class the instructor taught was left to the instructor's discretion based on the fact that she was an experienced instructor with over 15 years experience. I was in regular contact with the instructor to review and revise, when necessary, the format of the class as well as to keep her up to date on the continued participation of the participants.

Data Analysis and Interpretation

There were two components to data analysis as the information obtained was comprised of both qualitative and quantitative data. Case study, unlike other qualitative methodologies, does not utilize a specific method of data analysis. I therefore drew upon the data analysis strategies suggested by Miles and Huberman (1994), Creswell (2007), Merriam (1988), Stake (1995), and Yin (1984) to develop the process I incorporated.

The first step I took was to organize each participant's interviews, questionnaires and diaries and journals based on the timelines of the study. Each participant's data was then organized into a separate file; I analyzed all the data from each file in totality before I began the next. I did a cursory read through of all the data contained in the file to gain insight into that participant's story and to start to form ideas for how her story would be told. I began with the initial interview, reading through from start to finish, making marginal notes on general concepts I identified. From this first read through, I identified the six general concepts previously identified from the design of the interviews: those related to aging, menopause, exercise, experience of hot flashes, experience of night sweats and anticipated benefits of participating in the study. I reread the initial interview, this time underlining in different colours the key words, phrases and quotations that related to the identified concepts. Each category and supporting items were copied on to a separate sheet of paper with the category heading at the top of the page. The second item I analyzed was the self-reported journal. I read through the journal three times. The first time I familiarized myself with what the participant wrote about. The second time I began to develop categories based on recurring themes that emerged from the data. There were four categories that were common to all participants: exercise class, interaction with the class participants, hot flashes and/or night sweats and other perimenopause-related symptoms. The third time I began underlining in different colours the key words, phrases and quotations related to these categories and subsequently copied them on to a separate sheet with the category heading at the top of the page. The

third item I analyzed was the symptom diary. This step was omitted for those women who did not keep a separate symptom diary but had included this information in their self-reported diary. As the symptom diary contained strictly numerical data regarding hot flashes and/or night sweats (i.e. incidence, frequency and time), I copied this information directly on to the sheets related to the symptom. I then compared the data from the diary to the entries in the journal to corroborate authenticity. The last item I analyzed was the final interview. I followed the same format for analysis as I did for the initial interview.

Data gathered from the WHAS was analyzed using descriptive statistics. Using a similar process as Li et al. (1999), the symptoms were grouped into four dimensions: vasomotor, psychosomatic, menstrual and sexual. The vasomotor dimension included responses from Items #1 and #2 of the WHAS. Psychosomatic included responses from Items #3 to #38, consecutively. The menstrual dimension included responses from Items #42 to #49 consecutively and the sexual dimension was comprised of responses from Items #39, #40, and #41. Responses for frequency and distress were analyzed separately. Both frequency and distress were rated on a five point scale. Frequency scores were rated as 0 = "never", 1 = "rarely", 2 = "sometimes", 3 = "often", and 4 = "always". Distress scores were rated as 0 = "not at all", 1 = "a little", 2 = "moderately", 3 = "quite a bit", and 4 = "extremely". The average scores for each dimension were calculated by using the scores for all of the responses pertaining to that dimension. The average scores for each response were also calculated. The analysis comprised the differences between the responses of the participant before and after the exercise intervention. Due to the small number of participants, any further statistical analyses were not conducted.

Establishing Rigor

In qualitative research, establishing rigor refers to how the quality of the research can be tested or confirmed. Trustworthiness is the standard for rigor in the paradigm of understanding. Guba and Lincoln (1998) have put forward the concepts of confirmability, dependability, credibility, and transferability to measure the quality of research. Confirmability refers to being up front about inherent biases that inevitably exist when conducting qualitative research. It is the researcher's role to be explicit about personal assumptions or values that may influence any decisions made. It is also the researcher's role to ensure that the data used for and the steps of analysis are retained and made available for reanalysis. Dependability refers to consistency between researchers as well as methods. If multiple researchers are conducting the same study, they have used comparable data collection protocols. The research design must also fit what the research question(s) are asking. Credibility refers to the truth value of the findings. The findings of the study should make sense and provide a realistic account of what was studied. Transferability refers to whether the results of the study can be applied to other contexts or samples. In this study, I have used the following approaches to ensure that the research methods and findings meet the conventions to establish trustworthiness.

Triangulation

Triangulation is "based on the idea of convergence of multiple perspectives for mutual confirmation of data to ensure that all aspects of a phenomenon have been investigated" (Krefting, 1991, p. 219). I have utilized two types of data triangulation in this study. The first is triangulation of methodologies. In employing different methodologies, the researcher limits inherent bias that would arise from using just one methodology. As Creswell (1994) notes, using more than one measurement strategy increases the truth of the research findings. The second type of triangulation I used was triangulation of data sources. As Morse and Richards (2002) note, the amount of data must be sufficient enough and appropriate based on the theoretical needs of the study. Finally, as Yin (2003) suggests, it is

not enough just to collect multiple sources of data, but the events or facts must also be supported by more than a single source of evidence. In this study, I collected data using multiple methods making use of interviews, documents as well as numerical data. Furthermore, I ensured that the facts were supported by more than just one source. For example, the participant's change in symptoms was obtained from the interview, their journal, as well as the WHAS. In this way, I was able to encompass multiple sources of data to better understand the topic of my research.

Member checking

The technique of member checking involves verifying with the study participants that the researcher's interpretations and conclusions were accurately interpreted (Lincoln & Guba, 1985). To apply this technique, I had each participant read over a copy of her transcript from both the initial and final interviews. As well, each participant was forwarded a copy of her final narrative. Each was asked to provide comments, make corrections and/or amend each of these documents.

Reflexivity

The axiological assumption of qualitative research states that the research process is inherently value-laden and biased (Lincoln & Guba, 1985). Reflexivity is a process by which I as the researcher take a step back from my research and examine who I am and what factors have influenced my choices and decisions throughout the research process. In a sense, I am analyzing and interpreting my own beliefs, values and assumptions in much the same way as I would if I were a participant in my study.

As mentioned in Chapter One, exercise has always been a part of my life. I strongly believe that regular exercise plays a definitive role in being healthy and having a high quality of life. Being healthy to me does not just mean absence of disease but encompasses every aspect of personhood i.e. physical, spiritual, functional, psychological and social. Exercise is intricately woven into each of these aspects. Preventing heart disease, preventing falls, improving self-esteem, reducing stress and providing a venue

for social interaction are just a few issues that can be addressed through regular exercise. This, in itself, is my biggest bias – I strongly believe that exercise, either directly or indirectly, can provide women with a means to cope with vasomotor symptoms without negative side effects. During my interaction with the women in this study, I tried to be as unbiased as possible when interviewing them and discussing with them the specifics of the study. I did not pass judgment about these women who I recognized already felt self-conscious and perhaps ashamed about the fact that they were sedentary. I realized that it took a lot of courage to admit to a total stranger that they didn't exercise, even though they knew that they should. I also tried to bracket my belief in exercise as I was analyzing the data, letting the process be truly inductive and the true nature of the women's stories evolve from their interviews and journals.

I admit that I was disappointed as each of the four women withdrew from the study. I had to keep reminding myself that despite every good intention, life gets in the way. For these women, seeing this class through to the end was just not possible at this point in their lives. Perhaps another opportunity will present itself to these women and their lives will permit regular exercise to become a part of it.

Participant Profiles

Each of the four participants who completed the intervention was asked to provide me with a short biography of herself. What follows is a brief history of each participant, edited by myself only for continuity. The names of the participants are fictitious, chosen by me and approved by each participant.

Michelle

Michelle is a divorced 43 year-old with a family of four children. She attended University in Thunder Bay. Michelle describes herself as a very kind and considerate individual who shares her belief system with family and friends. She is employed as a full-time community health worker. Her workday is spent primarily advocating for the hard-to-service population and networking external agencies to

provide supports for her clients who are comprised of aboriginal, seniors and transient populations. She spends a lot of her time with the clinical staff and patients. In her free time she enjoys quiet time, reading novels, spending time with family and friends, and shopping.

Michelle is part of a large family and was born and raised in a small town in Northwestern Ontario. She has lived in Thunder Bay for eighteen years. Her father, who is now deceased, was French and her mother is Ojibwa. Both parents survived the depression. Her family was raised with very strong cultural values and beliefs. They were brought up to respect their elders and other people who were less fortunate and taught that there are many people in this world that struggle on a daily basis just to live. Her family was taught to be especially grateful for their health but to also be grateful for the jobs, items, food, clothing and other material items that they had. Michelle recalls that there was never any gossip within the household about other peoples' struggles while she was growing up.

Theresa

Theresa is 48 years old and is married with two children. She was born and raised in Thunder Bay. Her parents emigrated from Italy to Thunder Bay in the early 1950s. She is currently employed as a health record technician. She attended Confederation College and graduated with a medical secretary diploma in 1980 and later took correspondence courses through Ottawa to become a health record technician. In her free time she likes to play the piano and rug-hook. Theresa's family and friends are very important to her. She is very involved with the church and regularly attends CWL meetings. Theresa enjoys making food from scratch such as canning and baking.

Suzie

Suzie is a married 54 year-old with no children. She was born in northern Minnesota, U.S.A. and was the second of four children. Her father, now deceased, served as a medic in WWII and the Korean War. Her mother was a Certified Nurse's Assistant prior to getting married. Once she married,

she took time off work to raise her children and returned to the nursing vocation once her children were teenagers. She received a diploma as an Educational Assistant from Lake Superior College and was employed as an interpreter for the deaf. Married in the late 1970s, she moved to Thunder Bay, Ontario where she currently resides. Her family consists of her husband, a stepson and his family, and her dogs. She is employed as a full-time educational assistant. As an educational assistant, Suzie works with autistic children as well as children with ODD, ADHD, the deaf and hard of hearing as well as other students who are struggling with academics. She is also employed part-time in a gift shop. Suzie enjoys cooking and entertaining friends, volunteering in the community, the outdoors, crafts, travel, animals and above all, spending time with family and friends.

Lorraine

Lorraine is 53 year-old married mother of two children. She lives in a rural area of Thunder Bay with her husband and one of her children. Lorraine was adopted at birth by French parents and grew up along with her brother in Thunder Bay. Sadly, her brother was killed in an industrial accident. After Lorraine completed high school, she worked at various jobs in and around the City. Currently she is employed full-time as a maintenance staff person, a job that she describes as very physically demanding. In her spare time, Lorraine enjoys reading and gardening. She also enjoys spending time with her family.

Chapter Four - Results

Michelle

I was contacted by Michelle via e-mail in response to a copy of my poster she had seen at her place of work. I phoned Michelle back and during our conversation, she relayed to me that she had undergone a partial hysterectomy and was experiencing symptoms with regularity. Arrangements were made to meet Michelle at her office the following Monday at 6:00p.m. I arrived at her workplace a few minutes early. As I waited for her, I noted how busy her workplace was – people talking and moving about, phones ringing – constant motion, a very action-packed place. Upon being ushered into her office, I was met with various artefacts that spoke of her heritage spread throughout the room. Sunlight streamed in through a lone window that offered a view of the parking lot. I sat in a metal and leather chair. Michelle ignored her comfortable-looking desk chair and sat off to my right in a similar chair to mine. She tucked a leg under her as she sat facing me. I noted she looked drawn and tired and put it down to the lateness of the day. We exchanged pleasantries and then began the interview.

We went through the Participant Cover Letter and she signed the Informed Consent. During this time, she was called out of her office by the receptionist. Michelle explained to me that a mobile screening unit was setting up in the parking lot and she needed to move her vehicle. She excused herself and left. She promptly returned at which point I handed the Questionnaire to her and explained to her how to fill it out. She did so and filled it out in my presence, stopping only to ask for clarification once. While she was going through the Questionnaire, several times she remarked that it was "very eye opening". She also remarked that up until now, she was unaware that all of the symptoms listed in the Questionnaire were symptoms of perimenopause. We then began the formal interview.

When asked about thoughts about growing older, Michelle stated that she doesn't mind; growing older is "just the nature of the beast". She believes that in her family aging is more respected

and that "we kind of age with grace". Her concerns centred more on being able to provide for herself financially when she retires. Michelle hasn't been very active since starting her present job eight years ago. Prior to that time she was more active, "probably on a daily basis". She doesn't feel "that great" about not exercising now and is concerned about her body weight and how it affects her health. Turning to her thoughts about entering menopause, she is unsure of how she feels. She thought she'd "get it when I'm older, like in my 50s or something". However she spoke with members of her family who had experienced menopause in their late 30s so she's "kind of shocked that I'm going through it now" and further states, "oh no – this is it!" Yet at the same time she realizes that going through menopause is "a bridge that I just have to cross".

Michelle's experience with vasomotor symptoms began about a year ago. She states that she noticed it starting off with sleepless nights and then she proceeded to get hot flashes. In describing this period of her life, she noticed that she would awake in the early hours of the morning and would fall back to sleep but not until two or three hours had passed. She mentioned that the time until she would fall back to sleep had gradually increased until now she doesn't fall back to sleep at all. At the time of this interview, she had been awake since 3:00a.m. This explained the tired and drawn out look I had noticed earlier. She now experiences hot flashes during the day and night sweats. Although she experiences both symptoms on a daily basis, she notes that the night sweats are much more severe than the hot flashes. She can offer no explanation for why, stating "it's strange". When questioned about noticing any changes in the severity of the night sweats she remarks "I've noticed that a bit now that you've mentioned it but not to any great degree". She notices no patterns as to when or why the night sweats occur and comments "I'm dead asleep and then all of the sudden I'm kicking off the blankets". Michelle describes how she feels when she experiences a symptom:

> "My body basically just heating up...it could be 20 below in that room and I'm just sweating away. It's like my forehead starts heating up, my hair starts getting clammy...my scalp. [I feel] antsy – I have to get up and move."

When experiencing a night sweat, Michelle has two main strategies to cope with it. The first is to take a shower to cool off. Her other strategy is to do housework because "I just have to move". She has not tried any alternative therapies and does not want to try any type of medication. She hopes that by participating in the study, her symptoms will decrease naturally stating "I was thinking that if this [the study] helps solve [my symptoms], fantastic, because right now it's [the symptoms] are just driving me crazy".

Experience of the Exercise Class

On the whole, Michelle's experience of the exercise classes was positive and states that they were excellent classes to attend. She felt great to be getting back into "some sort of a routine". Michelle found that adjusting her work schedule to accommodate the classes was challenging. There were occasions, especially at the beginning, when she was asked to work overtime or to stay late on the evenings of the exercise classes. In those instances she worked until just before the class started, rushed home to get dressed and ran back out the door. There were occasions when she felt tired, had little energy and had to "drag" herself to class. Michelle found that participating in the exercise classes improved her mood and energy levels and allowed her to relieve stress. She notes that when she wasn't able to attend, she missed experiencing the classes. Michelle states that through participating in this study her self-esteem and confidence levels have improved. She feels that her fitness level has improved and states that her body feels "firmer".

Experience with Participants

From her very first class, Michelle noticed the camaraderie amongst the participants, noting that there was a lot of discussion about the many symptoms of menopause. She states, "Hell, we most likely developed our own support group!" Michelle enjoyed talking with the "ladies" before the class and wrote twice about sharing her own personal experiences and her appreciation on receiving an empathetic ear. Michelle enjoyed making new connections with the group and has arranged to keep in contact with another participant once the study has ended.

Experience of Symptoms

Michelle noticed an immediate decrease in the incidence of night sweats. The first night after the exercise class she experienced her first full night of sleeping symptom free since she began experiencing the symptoms over one year ago. The following morning she writes, "I was in shock! Every night I have woken after 2:00a.m. with night sweats except for last night. I had kicked off the blankets, waiting for the heat to come on - NOTHING". This pattern continued until the end of the second week when Michelle experienced a night sweat however she notes that it "wasn't as bad as the previous night sweats [I had] before the exercise class". From the sixth week on, Michelle did not experience a night sweat.

Michelle experienced variability with respect to the incidence and the severity of hot flashes. She had a minimum of one and a maximum of three per day with the severity ranging from 'a little' to 'extreme'. From the sixth week until the end of the study, Michelle noted six periods where she did not experience any hot flashes, the longest being fourteen days. Midway through study, Michelle began to notice a change in how she experienced this symptom, stating "my head seems to be hot or exceptionally warm", something she had not felt or noticed before. She continued to note the occurrence of this aspect of the hot flash but comments that she "tends to notice" the actual hot flash more than the warm head. Michelle had difficulty in journaling the occurrence of her hot flashes,

attributing this to the nature of her job. She states that because she'd experience a hot flash in the middle of a phone call or upon going in to see a patient, she was unable to record or remember to record the specifics of the event. She recalls that she would write the particulars of the experience on a post-it note and then fail to remember where she put the note – a process she called "a challenge".

Michelle noted with regularity five other symptoms that she experienced over the course of the study: memory loss, sleep, energy levels, headaches and mood.

Memory loss affected every aspect of her life and was something Michelle "didn't pay too much attention to until I joined this research project". From the beginning of the study, she often refers to memory loss as being "consistent and a pain in the ass" and later states that she "always blames this [memory loss] on menopause". She recalls misplacing items and forgetting to do things to the point that she was leaving post-it notes over her desk and voice-mail messages for herself as reminders. At one point she also enlisted her family members to remind her of tasks she needed to complete. She also sought the opinions of various individuals as to what she could do to improve her memory. There was no change in this symptom by the end of the study.

Quality of sleep and sleeping patterns were symptoms that Michelle kept track of. For the first three weeks of the study, Michelle's sleeping patterns were sporadic. There were nights where she would wake up several times, mixed together with the odd night of sleeping well. At the start of the fourth week, Michelle found that she would usually sleep for five or six hours straight on the nights she participated in the exercise class. It wasn't until the seventh week that Michelle notes that her "sleeping patterns have been good" and she wasn't taking any medication at night to stay asleep.

Energy levels were also sporadic and were not attributed to any one cause. For example, when Michelle wrote that she had a good night sleep, she wrote that she felt drained of energy the following day. This symptom remained constant over the course of the study.

Michelle also recorded having headaches throughout the study. She noted that she had four within the first four weeks of the study and only two after that. The decrease in frequency was also coupled with a decrease in severity which she noted at the end of the study.

Mood fluctuations were also a concern for Michelle. Occasionally, she noted her poor moods were related to her lack of sleep. Michelle became more aware of her mood swings and the stabilizing effect exercise seemed to have on them commenting on how she would feel in "better spirits" after an exercise class.

Journaling

Michelle found the process of journaling challenging for the reason that she "does enough paperwork at work... I'm on the computer all day...I'm doing charting". She states that if she ever had to journal again, she would be sure to block out a time during the day to devote to just journaling. To Michelle, the act of journaling was helpful to reflect back on and become more aware of what she was experiencing over the course of the study. This became evident when reading through her journal entries. During the fourth week of the study, Michelle would make regular entries that started off with "I notice that...." For example, she wrote "I notice I have more time for self-care during the evenings" and "I notice I tend to focus on the class and try to relax my mind from the daily strain".

Perhaps this process of reflection has brought about a change in her views on getting older. At the beginning of the study, Michelle stated that she didn't mind getting older. After the study ended, she stated "I notice I'm having more difficulty [with growing older]". She attributes this to becoming more aware of the impact her symptoms are having on her as well as how she felt her body responded to the exercise. Michelle still accepts getting older but is "kind of on the borderline" and later states "but that's life, you get older anyway".

At the time of the final interview, Michelle had not been exercising for three weeks. Michelle now views exercise as something she needs and wants. She states that there is a history of health problems in her family that she wants to avoid. Of more of a concern to her is the fact that as she had not been exercising since the end of the third week of June, she is seeing a return of her symptoms and states "I'm starting up again...I don't want to start that pattern over again because it was nuts....it was psychotic! I can't go back to that". To that end, she has joined an exercise class at a fitness facility that meets three times a week and plans to continue to make exercise a part of her life.

Theresa

I was contacted by Theresa by telephone in response to my poster that she had seen at her workplace. Theresa met all the inclusion criteria except one. During our conversation, I learned that she was currently exercising five days per week. Her routine consisted of treadmill walking, stationary bicycling and using small hand weights. I was concerned about her eligibility because of this, but after talking it over with my thesis supervisor, I made the decision to allow her to be a part of the program. I arranged to meet with Theresa at my workplace after she finished work. I met her at the reception area and brought her to a private office.

I first explained to her about the conflict regarding her current exercise routine. She was taken aback and apologized for overlooking this point. She was very concerned that she would not be allowed to participate in the class. I assured her that she could still be a part of the study to which she expressed her gratitude. We continued on and I reviewed the contents of the Participant Cover Letter with her and she signed the Informed Consent. I handed the Questionnaire to her and explained how to fill it out. She did so in my presence without interruption. We then began the interview.

Theresa's response when asked what she thought about getting older was refreshing. She replied "I look forward to it" but immediately added "but being healthy to get older is the key for me".

She further explained that she did not want to be dependent on someone looking after her nor did she want to be immobile. She sees aging as "part of the process – the wheel of life".

When asked about what exercise means to her, Theresa stated that to her, "exercise is very important – it means being able to do more, having more energy". She also talked about feeling better when exercising because exercise "elicits good endorphins". Theresa has exercised in the past but has done so sporadically. She remarked that when she had her children, "life was very busy" and she did not have the time to exercise regularly. But when she was in her late 30s, she realized that "if I don't start doing something that is a bit more routine, I'm hurting myself and won't be there later in life for my family".

Theresa's thoughts about entering menopause are ambivalent stating "I don't know if it's all that much fun! Aging and menopause are not the same thing that's for sure, but I do know they go hand in hand." She looks forward to "not having a period someday" but feels that the effects of aging and menopause are things that "you just gotta take!"

Theresa began experiencing hot flashes about two months before the interview and has experienced no change in severity or frequency since that time. At the time of the interview, she had not yet experienced night sweats. Theresa describes her hot flashes as "an extreme high hot body temperature and my ears turn red". She feels uncontrollably hot around her head, ears, arms, armpits and neck area and wishes she could change into lighter clothing. Her feelings of extreme heat make her feel like she needs to have a shower. When Theresa is experiencing a hot flash at work, she tries to stay focussed on something else and tries to do lighter instead of more physical duties. There are fans that she uses to cool herself off and also finds that drinking cold ice water is beneficial.

Even though Theresa's symptoms have just recently started, she has been reading about trying herbal products like teas. She does not want to try hormone replacement therapy as she's heard "it's

not all that great". Theresa is looking forward to being more educated about menopause and getting more fit.

Experience of the Exercise Class

Theresa looked upon attending the exercise class as a "time reserved for me and was my part of the day". Theresa thoroughly enjoyed the exercise classes, always referring to them as "fun and enjoyable". She looked forward to attending each class and learning new exercises. Theresa was very affected by the instructor of the class. She mentioned that the instructor's cheerful and upbeat disposition was infectious and "I never left her class with a sad look". Theresa was also inspired to take what she learned in the class and incorporate it into her home routine. Theresa feels more "empowered" as a result of learning and incorporating the variety of exercises and equipment.

Experience with Participants

When questioned what the experience of the study has been like for her, Theresa responds, "the companionship has been great". She feels that the camaraderie amongst the participants was important and that being able to "exercise and share your highs and lows...builds strength". She developed friendships with the participants and states that being part of a group was motivating for her "cause you look forward to seeing others and see how they made out". Theresa also feels that for her, being part of the group made her commitment stronger.

Experience of Symptoms

Theresa states that for her the exercise has helped because she doesn't perceive the hot flashes to "be as strong and upsetting to the body, they seem to be milder". This statement can be supported from her response in the WHAS in that although she has experienced more hot flashes, she does not feel that they were at all bothersome or distressful.

Theresa's low energy and variable sleep patterns were noted to be a recurring pattern in Theresa's journal. In comparing her answers regarding these symptoms on the WHAS, the severity of early morning wakening has become more bothersome or distressful since the beginning of the study. Furthermore the frequency and severity of lack of energy has increased. Theresa is prone to migraines and recorded experiencing one severe migraine during the study.

Exercise

Theresa continued to keep up with her home exercise routine throughout the course of the study. She was physically active for 30-60 minutes on most days of the week she was not attending the exercise class. Theresa engaged in activities such as treadmill walking, stationary cycling, outdoor walking/jogging and strength training. Theresa recognized her views on exercise intensity had changed. Prior to participating in the study, Theresa had mentioned that she disliked "that sweaty feeling"; however by the end of the study, she didn't mind it so much stating "it [being sweaty] is good because it means you are being challenged to do more".

Journaling

Journaling for Theresa was a process she believed was more for my benefit than hers stating "for me, I could take it or leave it". She chose not to use the symptom diary but documented her hot flashes in her daily journal as it was more convenient for her.

Theresa plans to continue to exercise regularly incorporating the variety of exercises that she learned in the exercise class. She states that for her it's important to exercise to stay healthy.

Suzie

I was contacted by Suzie by telephone after my poster was given to her by her husband. I am an acquaintance of Suzie's husband and had been introduced to Suzie at a social function held at their house last year. After ensuring that Suzie met the criteria for acceptance into the study, I made an

appointment to meet with her at her house. When I arrived at her front door, I was greeted by two of Suzie's dogs and then Suzie. Suzie offered to get me a snack and I sat at her dining room table while she went into the kitchen. When she returned, she joined me at the table with our snack. We proceeded to chat about the addition of her recent dog and other events and then turned our attention to the matter at hand.

I reviewed the contents of the Participant Cover Letter with her and she signed the Informed Consent. I handed the Questionnaire to her and explained how to fill it out. She did so in my presence, pausing every so often to reflect on the answer to a question. We then began the interview.

Suzie is not at all concerned with growing older referring to aging as "a stage of life – another page in the book". She envisions herself retiring from her current job in the next five years or so and possibly starting a different career. She wants to lose weight and improve her well being but sees these things as challenging to achieve. Suzie considers any physical activity as exercise including daily household chores and yard work. She also considers the distance she has to cover through walking at her workplace as exercise too. Suzie has been inactive for about the last ten months. Immediately prior to that time she was walking, lifting weights and doing calisthenics. When asked about her thoughts of menopause, Suzie replied "Actually, I'm looking forward to it!" She looks forward to when she doesn't have a period anymore because "it never was an easy thing" as she experienced severe cramps and was sick. She hopes that she doesn't experience what her mother went through "having major hot flashes and she was major crabby...I'm hoping I don't go that route".

Suzie started experiencing hot flashes about a year ago. At the time she "wasn't really sure if it was or not because everybody talked a lot about everything burning and I never had that...Everyone else I talk to are ripping their clothes off because they feel like their whole body's on fire and I'm thinking 'what's your problem' [be]cause I have never experienced that yet!" Suzie describes experiencing a hot

flash as starting "in the neck and goes right to the top of my head". She doesn't sweat but notices "just the feeling of hot....going up the neck, you get warmer and warmer and warmer and then it hits a plateau". Suzie doesn't experience the feelings of warmth anywhere else in her body except her face and neck. Suzie is "a little bit uncomfortable" when she has a hot flash because other people notice it and draw attention to it, an action she finds "a little bit embarrassing". She is not really affected by having a hot flash and states when one occurs she "just keeps going with what I was doing". Suzie's experiences with night sweats has been irregular noting that she's had "maybe a couple within the last six months". She cannot say why she has not had more and suggests that it could be because she sleeps by an open window. Furthermore her dogs sleep right beside her on her bed making it "really, really hard to tell" if she gets hot because of "the other insulators" or because she is having a night sweat.

Suzie is interested in participating in the study to see if exercise would make "any difference in the hot flashes I've had". She is also hoping that it will help her get a better lifestyle because to her "a lot of it [symptoms] has to do with diet and lifestyle" and hopes that changes in one will bring about changes in the other.

Experience of the Exercise Class

Suzie's experience of the exercise class was very positive and states that she enjoyed the classes and looked forward to attending them. She viewed the classes as a "time to reflect and do something for me". Suzie had to rearrange her work schedule in order to be able to attend the classes. Suzie states that there were occasions when she found it difficult to get motivated to come, usually after a busy day at work. She did find however that "once I got there and started into the routine, I felt better". Suzie feels that participating in the study has "made me more aware of me" and has motivated her to get back into a regular exercise routine. She began incorporating at least one extra day per week of

exercise in addition to participating in the classes at the end of the first week. Suzie also states that over the course of the study, she has lost both weight and inches and feels healthier.

Experience with Participants

Suzie felt that socializing with the other participants was the most enjoyable aspect about the study. She found it "comforting to hear others share problems and to know it's not just me". Suzie also noted that the women "connected well", despite the fact that they "all came from different lifestyles, backgrounds and professions", and were at "different stages of menopause". She also mentions that the women enjoyed each other's company and were encouraging of each other and says "we made some good friendships".

Experience of Symptoms

Suzie experienced variability in the frequency of her hot flashes. She notes that the severity of her symptoms did not vary and had always rated them as "a little". On two occasions Suzie writes that she is thankful that her hot flashes are not the "wanna strip firehouse kind". Suzie commented that the symptoms are "quick to come on and quick to leave" lasting between 5 and 10 minutes. During the fourth week, Suzie began to use a different method to note her symptoms, preferring to use a tracking chart instead of the symptom diary given to her. Two weeks after that, she noted that "the hot flashes are almost always at the same time". Midway through the study, Suzie began to notice a distinct decrease in her symptoms. During the seventh week, Suzie began to have days where she did not experience any symptoms and began to occasionally question whether she had actually experienced a hot flash or not. At the time of the final interview, Suzie states "since the end of June, I haven't had one".

Suzie noted three other symptoms she experienced with regularity over the course of the study: sleep, headaches, and upset stomach.

Difficulties Suzie experienced with sleep surrounded the issue of quality of sleep. Suzie is a self-professed "night hawk" seldom going to sleep before midnight. She is usually up at least once during the night to care for her dogs. For the first six weeks of the study Suzie seldom had a full night's sleep, waking up multiple times during the night. Her sleeping patterns changed during the seventh week when she began to experience less wakeful nights noting that she "slept well" or "slept great". This pattern continued on until the end of the study.

Suzie experienced several headaches throughout the study. She noted that she had two within the first two weeks of the study and four in the last two weeks. In the initial WHAS, Suzie indicated that she 'sometimes' experienced headaches which she rated as 'a little' bothersome/distressful. In the final WHAS, Suzie indicated that while the distress of the symptom remained the same, the frequency of her headaches decreased to 'rarely'.

Suzie sporadically experienced an upset stomach throughout the study. On four separate occasions, she attended class with an upset stomach noting that twice she "felt better" after attending the class. This was a symptom that Suzie indicated had worsened in frequency on the final WHAS.

Journaling

Suzie found journaling an important part of the study. She states that it increased her awareness of "a lot of things you just take for granted" and through writing them down "makes them more real". This is reflected in her journal when she writes that through documenting her symptoms, she noticed more hot flashes and wrote "perhaps before I didn't think about it". Suzie also used her journal to motivate herself to exercise at home as well as keeping track of what she did. At one point, she was also documenting her eating patterns to increase her awareness level.

Suzie realizes the importance of continuing with regular exercise to keep healthy. There is a history of diabetes and cardiovascular events in her family that she wants to "stay on top of". She has

joined an exercise class and has also "doing a bit here and there" using equipment that has been in "storage".

Lorraine

I was contacted by Lorraine via e-mail in response to a copy of my poster that had been distributed through her husband's workplace. Through e-mail we arranged to meet at my workplace after she finished work. I met Lorraine at the reception area and brought her to a private office. I thanked her for coming and gestured for her to sit in the chair I offered her. Lorraine sat down, removed her jacket and placed her purse beside her. She was relaxed and eager to begin our interview. Through general conversation, I found out that Lorraine knew of my family and we spoke briefly about that connection. She passed me the pre-screening forms that I had mailed to her and we began our meeting.

We went through the Participant Cover Letter and she signed the Informed Consent. I then handed the Questionnaire to her and explained to her how to fill it out. She quickly completed the form in my presence and returned it to me. We then began the formal interview.

When asked about thoughts about growing older, Lorraine didn't talk separately about aging and menopause but spoke about them simultaneously. Lorraine's response was quite blunt - "getting older – it sucks". She relayed how she "used to think it would be pretty good" and it would be "a piece of cake" because she would no longer have her periods. Now, however she's not so sure – "the periods are just about done and now I have the rest of the stuff. I think the periods weren't so bad!" She relates how she once viewed her 50 year-old mother as looking her age whereas she doesn't see herself in the same light. Instead she states "You know I think to myself I'm 50-plus and I don't feel I even look like I'm that age....I don't act like what I think a 50-plus person should be". Lorraine is not afraid of

getting older because she doesn't think of herself as being "that older person". One thing that does concern her about growing older is failing health and thinking "oh I don't have that much time".

Lorraine views exercise as "something I don't do very often obviously!" To her exercise means "working out...sit ups, weights, running". I found it interesting that even though the type of job Lorraine does is quite active, she does not mention this as exercise. She has been active in the past in activities such as organized sports and attending the gym but has not been exercising regularly since she was in her 30s. She admits that her activity level is sporadic and she "always has excuses about not exercising". For example, she tries to walk at home but then "I can't walk down the road now because the bears are out" or "okay now [the road] is too muddy". Lorraine also has access to a gym in the building where she works but doesn't go because "I just don't seem like I have enough time". When asked about how she feels about not exercising now she replies "I think I'm lazy!" Although her doctor tells her to exercise and she "knows that I would feel better", she has yet to implement steps towards exercising regularly.

Lorraine had taken hormone replacement therapy six months ago to help with her symptoms. She did notice relief from some of her symptoms while on HRT. After taking them for three months, she made the decision to stop taking them based on reading she had done as well as her past medical history with blood clots. She states that "some people swear by them [HRT] but I thought I was like prolonging the inevitable so you might as well just deal with it". Lorraine spoke about other women she had talked to about menopause. She refers to one who is 65 and "still going through it – that's scary" and further states "I'm thinking I don't want to go through menopause the rest of my life". She also refers to another woman who is the same age as her who has experienced "nothing, absolutely nothing" and jokingly says "aw, that's not fair!" In relating these experiences to herself, Lorraine says "the scale is so broad...I'm hoping I at least just kind of fall in the middle".

Lorraine has been experiencing night sweats since she was in her late 40s and hot flashes for approximately a year and a half. She describes the feeling of a hot flash as "They just come out of the blue. They start at the soles of my feet and then creeps up my body. It goes up to my neck." She notes that she feels a "burny kind of hot tingly kind of thing" all the way up to her neck but feels like she is sweating all over. The experience makes her feel "yicky...smelly...and clammy" and she showers more frequently so that she doesn't feel so "clammy". When she is at work, she removes her smock and goes to stand under a cold air duct to relieve the feelings of heat. She tries to cope with the experience by trying to ignore it because she knows they'll go away on their own.

To Lorraine, night sweats have "gotta be the worst". These symptoms are more severe and disruptive than hot flashes. The feeling of a night sweat is different than a hot flash in that "it's not that burny kind of flush-thing, I'm just hot". The night sweats interfere with Lorraine's sleep and "that makes me sick". In describing her experience, Lorraine notes that when she has a night sweat, "the covers come off, the bed gets wet, I sweat...I finally cool back down and then I'm chilled because I'm wet so I put the covers back on and it starts all over again...Nightgown gets tossed in the corner and go and get a towel". She finds that she gets up at least four times during the night, sometimes hourly, and tries to find someplace else to sleep. Not surprisingly, her night sweats interrupt her sleep to the point that she will take a sleeping pill if she has gone without sleep for days.

Besides briefly taking hormone replacement therapy Lorraine has also tried evening primrose to alleviate her symptoms. She hopes that the exercise class will help her symptoms but is also looking to the class as an incentive to get back into doing regular exercise.

Experience of the Exercise Class

Lorraine's experience of the exercise class was positive. She enjoyed attending the class and commented that she always felt good after exercising. Attending the class allowed her to regularly

exercise because she admits that she is "not an exercise on my own kind of person". After the first class, Lorraine stated that she "felt better at work than I have in a long time". At the end of the third week, Lorraine had participated in a 5km run that she completed in a time she was very pleased with. The day after the run she states "this is the best I've ever felt after the run in all the years I've been doing it – very little stiffness, usually I can't walk". By the end of the study, Lorraine notes that she has more energy, is more limber without "all the joint aches and pains", and can perform her yard work easier. Lorraine also noticed that she lost inches and feels like she's firmed up. Residing in a rural area, the biggest adjustment Lorraine had to make to attend the class was to make two trips into the city. After returning from work, she prefers to remain home and not make a second trip into the city. Towards the end of the study, Lorraine found it difficult to get motivated to come to class because of the weather stating "it's hard to get motivated when it's nice out when you've been waiting all winter for that". On these occasions she was encouraged to attend the class by her husband who told her "you should go". She also told herself that she "would feel like crap if I don't go!" She states that over the course of the study, her mood has improved and she now has more energy which allows her to get more accomplished at home after she finishes work. Lorraine experienced one menstrual cycle towards the end of the seventh week of the study, an event she states was "totally unexpected".

Experience with Participants

Lorraine states that she enjoyed the company of the other participants. She refers to them as an "interesting bunch" in that they are all so "different but going through the same thing". She mentions that it was "nice to meet new people" and has developed a friendship with one of the participants. Lorraine also looked to the participants as motivators and states when she "didn't want to go to class...the enthusiasm amongst the girls made me happy that I went".

Experience of Symptoms

At the beginning of the study, Lorraine experienced night sweats on a nightly basis until the end of the second week when she had five consecutive nights without an occurrence. The interval between the symptom and symptom-free nights became greater until the end of the fourth week when Lorraine did not experience any symptoms, this time for fourteen consecutive nights. It was also during this period that Lorraine had her menstrual cycle. For the remaining four weeks, Lorraine experienced only three nights with symptoms, the remaining eighteen nights symptom free.

Lorraine's experience with hot flashes decreased over the course of the study. At the beginning of the study, she noted having multiple days with more than five hot flashes she rated as 'moderate', each ranging from two to five minutes in length. The incidence and severity slowly decreased until the seventh week when she had no symptoms for eighteen days. As previously mentioned, this was also the period when Lorraine experienced a menstrual cycle. She speculates in her journal that the "reoccurrence of my symptoms must have something to do with having a period". After the seventh week, she did experience symptoms but she noted they were infrequent and not as severe- a fact Lorraine notes she "can deal with".

Lorraine noted four other symptoms that she experienced with regularity over the course of the study: joint aches and pains, sleep, mood and energy levels.

Joint aches and pains were something that Lorraine commented on throughout the study. She notes that her legs, feet and back are areas that she usually experiences stiffness and soreness in. As the study progressed, Lorraine became aware of how, through the exercise, she felt less pain and stiffness. By the end of the study, Lorraine felt that her joint aches and pains were "definitely better".

Sleeping patterns were, and still remain, an issue for Lorraine. On one occasion partway through the study, she "cheated and took a sleeping pill" because she had not slept well for a few days.

When she does sleep well, Lorraine notes that it "sure makes a big difference on my outlook on life when I have had a good night's sleep". Lorraine feels that her sleeping "is still kind of nuts" and wonders how much that has to do with anxiety noting that when she is very worried, she has trouble sleeping.

Lorraine noted fluctuations in her mood over the course of the study. At times she could relate her bad mood to how little sleep she had the night before. Lorraine also wrote about feeling depressed and sad on at least three occasions, once during her menstrual period. At that time, she notes she didn't know if "it's my period or the weather that's making me depressed". She also recounts a time when she "got very emotional" at a ceremony for a relative and states she doesn't "remember being so mushy before". Lorraine cites that one benefit from taking part in the study is that she is "not so bitchy at everybody" and attributes this to the fact that she is able to accomplish more so she feels better about herself.

Lorraine experienced an improvement in her energy levels over the course of the study. She always felt energized after participating in the class noting that she has "more energy after class than all day". Increased energy levels also transferred into Lorraine being able to do more at home. Now she finds that when she comes home from work "I'm busy right from when I get home from work until it's time to go to bed and then I stop". She finds that she accomplishes more which, as mentioned above, directly affects her mood and sense of well being. Perhaps this improvement in Lorraine's well being can account for the change in her outlook on aging. She now states that she "thinks I've gotten over the fact that I am getting older...I can survive the uphill climb to 60, no problem!"

Journaling

Lorraine felt that having to keep track of her symptoms made her more aware of them. She feels that she "could have ignored them more if I didn't have to write them down". She also felt that the symptoms "wouldn't have seemed like they lasted so long" had she not had to keep track of them.

Cross-Case Analysis

Experience of the Exercise Class

Taking part in the exercise class was a very positive experience for all of the women. The exercise class served as a place for not only meeting their physical needs, but their psychological and social needs as well. All of the women talked about how they established friendships and gained both emotional and psychological support from each other. The women referred to the class as their "support group" - a place where they could share common experiences and gain an empathetic ear. For Theresa and Lorraine, the other women also provided motivation to keep attending the class. Theresa "looked forward to seeing others and see how they made out" while Lorraine noted that when she found it difficult to get motivated, the "enthusiasm amongst the girls made me happy that I went".

Participating in the class was also instrumental in improving self-esteem, self-confidence and well being for the women. Lorraine found that because both her mood and energy levels improved over the course of the study, she feels better about herself. She can now accomplish more at home which has improved her mood and has also given her an improved sense of well being. For Theresa, being taught how to incorporate various exercises and equipment empowered her to be able to add to her home routine. Suzie believes that through participating in the class she is more self-aware and feels healthier.

In looking at physical changes, all the women stated that they felt their bodies had changed over the course of the study. Theresa noticed that she feels she has "toned up" while Michelle states that

her fitness level has improved and her body feels "firmer", a sentiment echoed by both Suzie and Lorraine. Suzie also mentioned that she lost both body weight and inches. Lorraine's experience of the aches and pains she felt in her legs, feet and back also improved over the course of the study.

Experience of Symptoms

All four of the women experienced hot flashes and two of the four experienced night sweats as well as hot flashes. I have listed the women along with the type and the length of time they have experienced the vasomotor symptom in Table 4.1.

How the Women Described Hot Flashes

There were both similarities and differences encompassing physical changes experienced during a hot flash. Each woman talked about feelings of heat when describing what it felt like to experience a hot flash, but with varying degrees and manner of presentation. Suzie noted she felt hot from her neck area up, whereas Theresa felt warmth from her torso and up, and Lorraine described the feeling as starting from the soles of her feet and working its way up her body. Suzie and Theresa both reported reddening of the skin but in unique ways. Suzie stated that her whole face and neck area would turn red whereas only Theresa noted that only her ears would turn red.

Table 4.1 Type and Length of Time of Experience of Vasomotor Symptoms

Name	Hot Flashes	Time Experienced Symptom	Night Sweats	Time Experienced Symptom
Michelle	Yes	One year	Yes	One year
Theresa	Yes	Two months	No	
Suzie	Yes	One year	No	
Lorraine	Yes	One and a half years	Yes	Seven years

Frequency and Intensity of Hot Flashes

The frequency and intensity of the hot flashes varied from woman to woman. Based on information they recorded in their symptom diaries, I have listed the frequency and severity of hot

flashes in Table 4.2. The women rated their symptoms on a scale from 0 =not at all to 4=extreme with the ratings of a little (1), moderate(2), and quite a bit(3) in between.

Table 4.2 Frequency and Intensity of Vasomotor Symptoms Reported in 10 Weeks

Name	Total number of hot flashes reported in 10 weeks	Range of severity of hot flashes reported in 10 weeks
Michelle	60	A little to extreme
Theresa	10	A little
Suzie	141	A little to quite a bit
Lorraine	168	A little to quite a bit

Theresa, who had just recently started experiencing hot flashes reported the lowest frequency of this symptom over the course of the study. Lorraine who had been experiencing hot flashes the longest also experienced the highest frequency of hot flashes. The frequency of Michelle's hot flashes is incomplete as she admitted that she found it difficult to record or to remember to record her symptoms in her diary. Regardless of how diligent the women were in recording their hot flashes, all of them reported experiencing a decrease in the frequency and/or intensity of this symptom by the end of the study.

How the Women Described Night Sweats

Michelle and Lorraine experienced night sweats and described them in a similar fashion. They both stated that to them the experience of night sweats was far more severe than the experience of hot flashes. Both described night sweats as feelings of extreme heat that wake them up and disrupt their sleep. They also similarly described how they wake from a sound sleep, kick off the covers, cool off and then get the chills. Lorraine also talked about the fact that she also changes her nightgown and sometimes her sheets after she experiences a night sweat.

Frequency and Intensity of Night Sweats

Based on information the two women recorded in their symptom diaries, I have listed the frequency and severity of night sweats in Table 4.3. The women rated their symptoms on a scale from not at all (0) to extreme(4) with the ratings of a little (1), moderate(2), and quite a bit(3) in between.

Table 4.3 Experience of Night Sweats Reported by Participants

Name	Total number of night sweats reported in 10 weeks	Range of severity of night sweats reported in 10 weeks
Michelle	4	A little to extreme
Lorraine	35	A little to quite a bit

Both Michelle and Lorraine had experienced night sweats on a nightly basis prior to beginning the exercise class. However over the course of the exercise class, both noticed a dramatic decrease in the frequency of this symptom. As can be seen from Table 4.3, the frequency of Michelle's night sweats were much lower than Lorraine's. This is because Michelle completely stopped experiencing night sweats after the fifth week of the exercise class. Lorraine also noted a steady decrease in the frequency of night sweats as the study progressed. Specifically she experienced slightly more than half of her night sweats (19 out of 35) during the first two weeks of the exercise class. This gradually tapered off and during the last two weeks of the exercise class she had experienced only two night sweats.

Results of the WHAS

While all of the women were required to complete Part A of the WHAS (frequency of symptom), only those women who experienced the symptom were to complete Part B (distress of symptom). Therefore the results in Figure 4.2 apply to only those women who indicated that they had experienced the symptom. Analysis of the WHAS revealed a trend that supported the women's experience in both frequency and distress of each of the four dimensions of symptoms. The average ratings for the frequency and distress of all four dimensions decreased at the end of the study period (Figure 4.1 and Figure 4.2). Frequency of vasomotor symptoms decreased from an average rating of 2.25 prior to the

intervention to 1.5 after the intervention. Similarly, the distress of vasomotor symptoms decreased from an average rating of 2.33 to 1.2 after the intervention.

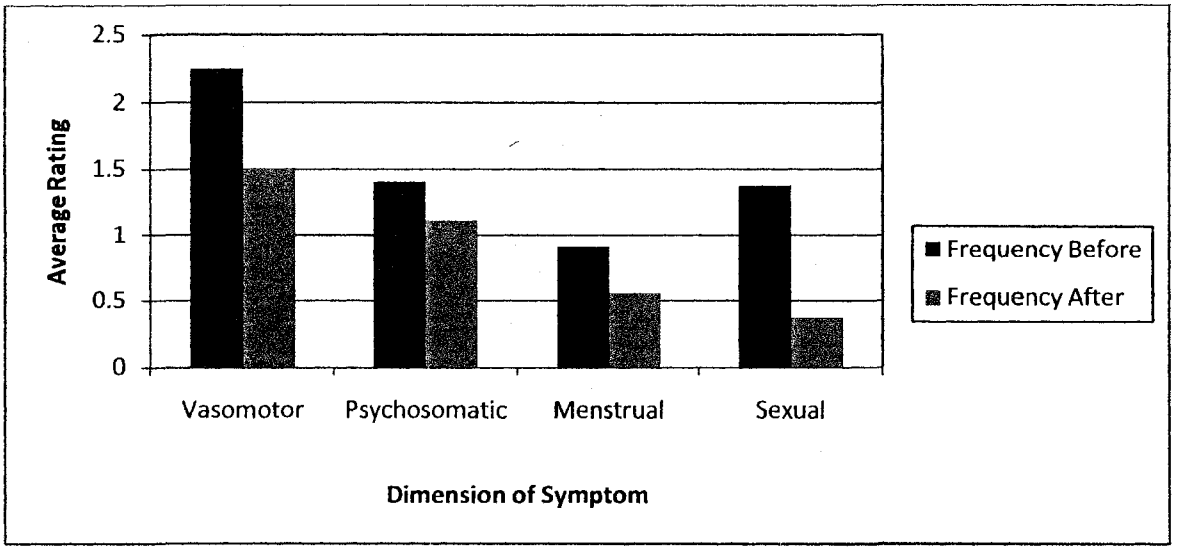

Figure 4.1 Average Rating of Frequency of Symptoms as Rated by all Participants before and after 10-week Exercise Intervention.

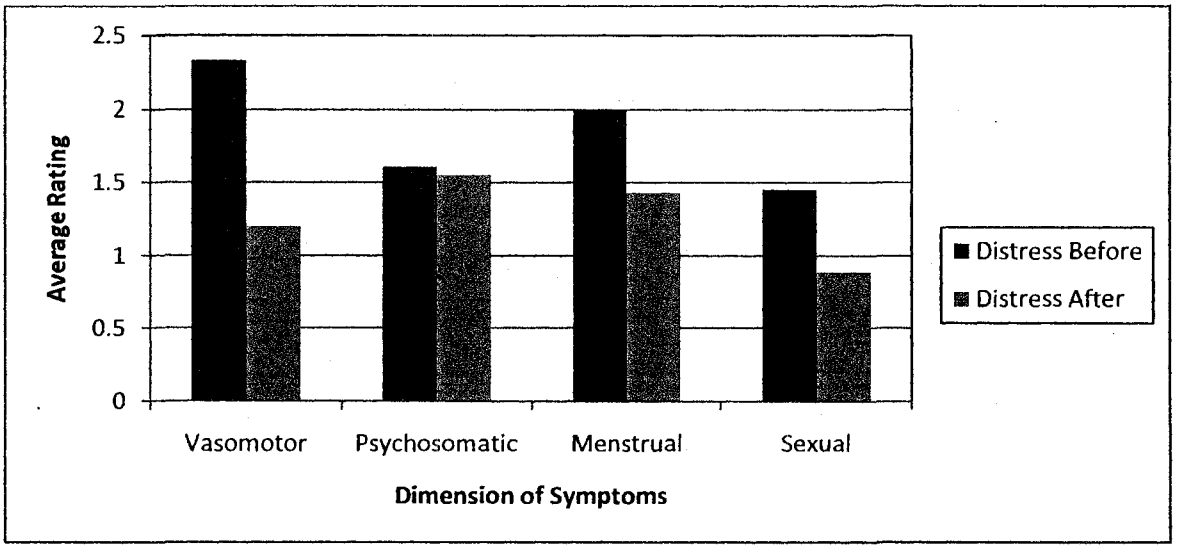

Figure 4.2. Average Rating of Distress of Symptoms as Rated by Participants who experienced the symptom before and after 10-week Exercise Intervention.

The symptoms most frequently reported by the participants before and after the intervention are noted in Table 4.4 and Table 4.5. While other symptoms were reported, Table 4.4. and Table 4.5 include only those symptoms that were experienced by all of the women. Both prior to and after the intervention, the participants noted that they most frequently experienced hot flashes, however the average rating decreased from 3.0 to 2.5. Two symptoms, early morning wakening and diarrhea or constipation, were most frequently reported prior to the intervention, but did not show up as a frequent symptom after the intervention.

Symptom	Average Rating
Hot Flashes	3.0
Early Morning Wakening	3.0
Lack of Energy	2.25
Diarrhea or Constipation	2.25
Forgetfulness	2.25
Bloated Stomach	2.25
Feeling Unattractive	2.25

Table 4. 4. Most Frequently Reported Symptoms by Ratings Before Exercise Intervention.

Symptom	Average Rating
Hot Flashes	2.5
Forgetfulness	2.5
Bloated Stomach	2.25
Lack of Energy	1.75
Difficulty Concentrating	1.75
Feeling Unattractive	1.75

Table 4.5. Most Frequently Reported Symptoms by Ratings After Exercise Intervention

Chapter Five - Discussion

Few studies have combined an exercise intervention with an in-depth description of how women's experiences of vasomotor symptoms are affected by exercise. The purpose of this research was to understand how participating in an exercise class affects the experience of vasomotor symptoms in perimenopausal women. Four women participated in the 10-week study. At its conclusion, all women reported that the exercise class had a positive impact on their vasomotor symptom experience. Specifically, the women noted a decrease in the frequency and/or severity of their vasomotor symptoms. Through their journals, the women identified psychosomatic and psychological symptoms they experienced over the course of the study. Participating in the study also provided the women with the opportunity to establish friendships as well as a social support network. The results of this study will be compared and contrasted to the existing literature below.

Relating Results to the Literature

The Experience of Vasomotor Symptoms

Experience of symptoms is a subjective event, one that was unique to each woman in the study. Generalized accounts of how vasomotor symptoms feel have been documented in the literature. According to the literature, hot flashes and night sweats are characterized by a sudden sensation of heat, flushing, and clamminess that starts in the head and neck area and then passes over the entire body. The sensation of heat is more apparent in the head, neck and upper torso (Berendsen, 2000; Fitzpatrick & Santen, 2002; Frackiewicz & Cutler, 2000). Freedman (2001) also notes that hot flashes are often accompanied with sweating in the "face, head, neck, and chest, but rarely in the lower body" (p. 453). The feelings of heat are followed by feelings of cold and clamminess (Fitzpatrick & Santen, 2002). The women of my study offered descriptions that varied from these generalized accounts. While all

women described the feelings of heat that characterize a hot flash, not all experienced the sensation through their entire body. Suzie noted that she only felt the heat in her face and neck and Theresa felt hot around her head, ears, arms, armpits and neck area. It is interesting to note that Lorraine states that she feels the hot flash starting at the soles of her feet and then moves up to her neck, which is contrary to what previous research has found. Also interesting to note is that both Michelle and Lorraine experience sweating over their entire body, something that Freedman (2001) states rarely occurs. Feelings of clamminess were also noted by Michelle, Theresa and Lorraine, but at different times. Theresa and Lorraine state that they feel clammy after the hot flash, while Michelle feels clammy during the hot flash. Only Michelle and Lorraine experience feelings of cold and only then after a night sweat. None of the participants reported feeling chilled after a hot flash, only after a night sweat.

Impact of the Exercise Class on Vasomotor and Psychosomatic Symptoms

All of the women experienced a decrease in either the frequency and/or severity of their vasomotor symptoms. The findings of my study contradict two of the three studies that employed an exercise intervention to measure the impact of cardiovascular exercise on vasomotor symptoms. Bear in mind that these two studies were both conducted from a quantitative perspective and I am therefore making general comparisons. The participants in the study conducted by Wilbur et al. (2005) experienced no change in either the frequency or intensity of vasomotor symptoms over the course of the 24-week study. This may be because the participants included premenopausal, perimenopausal and postmenopausal women while the women in my study were only perimenopausal. Furthermore, the intervention was an unmonitored home-based walking program whereas the intervention in my study was a monitored exercise class. The results of Aiello et al.'s (2004) study showed that there was an increase in the frequency of hot flashes. The increase in frequency may be accounted for by the fact that the average age of the participants in this study was 60.7 years. It may be that because of the age

of these women, they may have been past the age of experiencing vasomotor symptoms. The researchers also hypothesize that because the participants were classified as overweight (having a Body Mass Index of >27.5), they had higher propensity of experiencing symptoms. However, from self-reported data from the participants in my study, three of the four participants could also be classified as overweight, yet these women saw a decrease in their symptoms.

Although vasomotor symptoms were the main focus of this study, psychosomatic symptoms emerged from the data upon analysis that the participants experienced as troublesome. All of the women complained about issues related to sleep, including quality of sleep and sleeping patterns. While sleep difficulties have been associated with physiological changes that occur during perimenopause (Freedman, 2005), they were grouped as psychosomatic by the researchers who devised the WHAS. In order to maintain reliability in using the WHAS, I have therefore kept this categorization. Issues related to sleep is a complaint identified by other researchers (Dennerstein et al., 1993; Gold et al., 2000; Wilbur et al., 1990). Improved energy levels were noted by the women who were sedentary before the start of the study, a finding that supports what is well documented in the literature. Emotional changes were also experienced by two of the participants. Lorraine related times when she would be very moody or she would cry for no reason; Michelle related times when she was depressed for no apparent reason. These sentiments are mirrored by participants in the study by George (2002) study who stated that they felt they were on an "emotional roller coaster" (p.82) and could offer no explanation for why. Although Michelle was the only participant in my study to report forgetfulness, she found this symptom very distressing. Her feelings about this experience are duplicated verbatim by women in George's (2002) study who state that "they found this aspect to be worrisome and frustrating" (p.82).

Impact of the Exercise Class on Psychological Symptoms

Participating in the class was also instrumental in improving self-esteem, self-confidence and well being for the women. These experiences concur with those documented by both Jeng et al. (2004) and Parry and Shaw (1999). The participants in the study by Jeng et al. (2004) "perceived that they got 'health power' by themselves during the process of regular exercises" (p. 452). Parry and Shaw (1999) write that "the women felt that these [exercise and physically active leisure] activities contributed to their health and well being" (p. 211).

Addressing Social Needs through the Exercise Class

Without exception, the four women all enjoyed attending the classes and the positive feelings they felt afterwards. The most important aspect of the class was contact with the other women. From the first class, they spoke about the special bond they felt immediately between them. The opportunity to share their feelings about a common experience to empathetic ears was both a tremendous relief and release. They developed a sense of belonging through experiencing this class and sharing the ups and downs together. The women also drew upon each other as a source of motivation. Although they all participated in the study to further their own health, two of the women also stated that the biggest motivator for them was to foster friendships. This suggests that for these women, exercising in a group setting was instrumental for social support, a result that concurs with that of Jeng et al. (2004).

Summary

Considering the multiple roles and responsibilities women have in our society, women may be left with little time or energy to devote to themselves. With this in mind, committing to become physically active is in itself an accomplishment for the four women who completed the study. These women were able to make adjustments in their lives to attend the classes although they were

employed, most had children or were married, and all were involved in the community. The exercise class was the impetus the women in this study needed to do something for themselves, to improve their health and well being.

The women who participated in this study experienced vasomotor symptoms; however the impact, severity and frequency of these symptoms was unique to each woman. While accounts of what women should expect to feel or experience are given in the literature, it does not capture the individuality of this experience, as evidenced through this study. As previously discussed, all women reported a decrease in the frequency and/or severity of vasomotor symptoms. The results of this study are contrary to those of the majority of quantitative research studies which, I believe, can be attributed to the qualitative nature of this study. As this study utilized a case study method, I was able to obtain a detail-rich and holistic account of the women's experiences. In quantitative studies, the focus is on numerical data and not the women's accounts of their experiences. While women may experience a change in their symptoms, if the changes are not great enough to be deemed significant, the intervention may not be considered beneficial. However, through this study, what I have found is that although the changes on paper may not appear significant, they were significant to the women who experienced them. Positive changes in their symptoms were directly reflected in positive changes in their self-worth, self-esteem and well being.

Directions for Future Research

While it was beyond the scope of the purpose of this research to explain why this intervention was successful, future endeavours can build on the results of this study. Quantitative studies could be designed to include a qualitative component in the data collection methods. By incorporating qualitative data, the experiences of the participants could be combined with the numerical data to add depth to the results. Specifically, I would suggest that the women who comprise the outliers or

anomalies that are often inherent in this type of research be interviewed to see why their experiences are different. As this study found that the intervention impacted the women's lives on the psychological and social dimensions, future research could also build on these results. Specifically, utilizing a case control method, participants could be randomly assigned to an exercise group or a control group. The control group would contain women who did not exercise but participated in support group. Through this type of study, the researcher would be able to compare the two groups to see how important exercise vs. psychosocial support alone is in decreasing the frequency and/or severity of symptoms. Qualitative research can also build on the results of this study. I would suggest that future studies replicate the methods of this study but expand the sample size to deepen and broaden the results obtained, perhaps looking only at a specific ethnic group or women in a lower socioeconomic class.

Adherence is an issue that has been and continues to be prevalent in exercise programs. It is also an issue that future studies need to address. Based on my experience as both a researcher and as a professional working in the industry, I can offer the following suggestions. The first concerns time commitment. In this study, perhaps the length of time involved was too great to commit to as the women were required to immediately start exercising for one hour, three times a week. Future research may consider a graduated process to arrive at this point over a longer period of time. The issue of support from external sources can also be considered. Regardless of how motivated the women were, if they did not have the support of their families and/or employers, attending the classes would be difficult, if not impossible. Future research can take this into consideration and offer flexibility in scheduling classes at a time that would be convenient to the participants. I also believe that it is imperative for the researcher to know and understand how difficult it is to initiate and continue to exercise. In our fast-paced society where medication is both prominent and prevalent, it becomes understandable why taking a pill for symptoms could override the time and effort involved to attend an exercise class.

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Appendices

APPENDIX A

INFORMATIONAL BROCHURE

Do you currently suffer from hot flashes or night sweats?

If so, you may want to consider being one of eight participants in an exclusive research study to be conducted here in Thunder Bay.

My name is Reija Karioja and I am a Master's student in Kinesiology at Lakehead University. Under the supervision of Dr. Joey Farrell, I am currently recruiting volunteers to be active participants in my research study entitled, "How participating in a12-week exercise class affects the experience of hot flashes and/or night sweats perceived by perimenopausal women." If you are accepted into the study, you will be one of only eight women who will be providing valuable information on a topic of which very little is known about.

Interested? Here are the details:

To be eligible for the study you must meet ALL of the requirements below:

1. You have menstruated at least once within the past six months;
2. You have experienced at least one hot flash and/or night sweat within the past week;
3. You are a non-smoker;
4. You have NOT exercised for more than one hour per week in the past three months in activities that caused sweating and a rapid heart rate such as brisk walking, tennis, jogging, skiing, swimming for example
5. You are NOT currently taking hormone replacement therapy (HRT); and
6. You are NOT currently taking any medication prescribed by your doctor for high blood pressure or heart condition.

The expected start date of the study is the middle of March and will finish at the end of May, 2008.

Here's what you will be doing:

For three times per week for twelve consecutive weeks, you will be attending a fitness facility in Thunder Bay and participating in an exercise class led by a certified fitness instructor. Each class will be no longer than 60 minutes in length. The class is FREE OF CHARGE!!!

Along with participating in the exercise class, you will also be asked to record your symptoms in a diary along with your thoughts, feelings and experiences you may have over the course of the twelve weeks.

If you have been thinking about getting into shape, this just might be the opportunity you are looking for!

For further information about this study and how to become involved, please contact me:

Reija Karioja
Phone: 627-6474
e-mail: rckarioj@lakeheadu.ca

APPENDIX B

PRE-SCREENING QUESTIONNAIRE

Name: _____

Phone number where you can be reached: _____

1. In what year were you born? _____

2. In what country were you born? _____

3. In what country/countries were your parents born?

   Mother: _____

   Father: _____

4. What is your marital status? (please check one)

   - o Married
   - o Common law relationship
   - o Separated
   - o Divorced
   - o Widowed
   - o Single (never married)

5. How many children have you given birth to? _____

   In what year(s) were your children born in:

   _____ _____
   _____ _____
   _____ _____

6. What is the highest level of education you have completed? (please check one)

   - o Elementary school
   - o High school
   - o College certificate/diploma
   - o University undergraduate degree
   - o University graduate degree

7. Which of the following categories best describes you at present? (please check one)

   - o Employed full-time
   - o Employed part-time
   - o Full-time homemaker
   - o Retired
   - o Other (please specify): _____
   - o Unemployed
   - o Unable to work due to illness or injury

8. What is your primary occupation?

   _____

9. What is your annual family income before taxes? (please check one)

- o Under $20,000
- o $20,000 - $29,999
- o $30,000 - $39,999
- o $40,000 - $49,999
- o $50,000 - $74,999
- o $75,000 - $99,999
- o $100,000 - $150,000
- o Over $150,000
- o Would rather not say

SYMPTOM & MENSTRUAL HISTORY

1. In the past **month**, how many times have you experienced either hot flashes or night sweats?

- o Less than 5
- o 6-10
- o 11-20
- o More than 20

2. How many menstrual periods have you had in the last **six** months:

- o One
- o Two
- o Three
- o Four
- o Five
- o More than five

3. In the past **three** months, have you noticed the time between your monthly periods is:

- o Becoming further apart
- o Becoming closer together
- o No change in distance between periods

4. In the past **three** months, have you noticed that during your monthly periods, your menstrual bleeding is:

- o Longer than normal
- o Shorter than normal
- o No change in bleeding patterns

5. In the past **three** months, have you noticed that your menstrual bleeding is:

- o Heavier than normal
- o Lighter than normal
- o No change in bleeding

APPENDIX C
PHYSICAL ACTIVITY AND READINESS QUESTIONNAIRE (PAR-Q)

Physical Activity Readiness
Questionnaire - PAR-Q
(revised 2002)

PAR-Q & YOU

(A Questionnaire for People Aged 15 to 69)

Regular physical activity is fun and healthy, and increasingly more people are starting to become more active every day. Being more active is very safe for most people. However, some people should check with their doctor before they start becoming much more physically active.

If you are planning to become much more physically active than you are now, start by answering the seven questions in the box below. If you are between the ages of 15 and 69, the PAR-Q will tell you if you should check with your doctor before you start. If you are over 69 years of age, and you are not used to being very active, check with your doctor.

Common sense is your best guide when you answer these questions. Please read the questions carefully and answer each one honestly: check YES or NO.

YES	NO	
☐	☐	**1. Has your doctor ever said that you have a heart condition and that you should only do physical activity recommended by a doctor?**
☐	☐	**2. Do you feel pain in your chest when you do physical activity?**
☐	☐	**3. In the past month, have you had chest pain when you were not doing physical activity?**
☐	☐	**4. Do you lose your balance because of dizziness or do you ever lose consciousness?**
☐	☐	**5. Do you have a bone or joint problem (for example, back, knee or hip) that could be made worse by a change in your physical activity?**
☐	☐	**6. Is your doctor currently prescribing drugs (for example, water pills) for your blood pressure or heart condition?**
☐	☐	**7. Do you know of any other reason why you should not do physical activity?**

If you answered

YES to one or more questions

Talk with your doctor by phone or in person BEFORE you start becoming much more physically active or BEFORE you have a fitness appraisal. Tell your doctor about the PAR-Q and which questions you answered YES.

- You may be able to do any activity you want — as long as you start slowly and build up gradually. Or, you may need to restrict your activities to those which are safe for you. Talk with your doctor about the kinds of activities you wish to participate in and follow his/her advice.
- Find out which community programs are safe and helpful for you.

NO to all questions

If you answered NO honestly to all PAR-Q questions, you can be reasonably sure that you can:

- start becoming much more physically active – begin slowly and build up gradually. This is the safest and easiest way to go.
- take part in a fitness appraisal – this is an excellent way to determine your basic fitness so that you can plan the best way for you to live actively. It is also highly recommended that you have your blood pressure evaluated. If your reading is over 144/94, talk with your doctor before you start becoming much more physically active.

→

DELAY BECOMING MUCH MORE ACTIVE:

- if you are not feeling well because of a temporary illness such as a cold or a fever – wait until you feel better; or
- if you are or may be pregnant – talk to your doctor before you start becoming more active.

PLEASE NOTE: If your health changes so that you then answer YES to any of the above questions, tell your fitness or health professional. Ask whether you should change your physical activity plan.

Informed Use of the PAR-Q: The Canadian Society for Exercise Physiology, Health Canada, and their agents assume no liability for persons who undertake physical activity, and if in doubt after completing this questionnaire, consult your doctor prior to physical activity.

NOTE: If the PAR-Q is being given to a person before he or she participates in a physical activity program or a fitness appraisal, this section may be used for legal or administrative purposes.

"I have read, understood and completed this questionnaire. Any questions I had were answered to my full satisfaction."

NAME _____

SIGNATURE _____ DATE _____

SIGNATURE OF PARENT _____ WITNESS _____
or GUARDIAN (for participants under the age of majority)

Note: This physical activity clearance is valid for a maximum of 12 months from the date it is completed and becomes invalid if your condition changes so that you would answer YES to any of the seven questions.

Supported by: Health Canada Santé Canada

continued on other side...

...continued from other side

PAR-Q & YOU

Physical Activity Readiness Questionnaire - PAR-Q (revised 2002)

Canada's **Physical Activity Guide** *to Healthy Active Living*

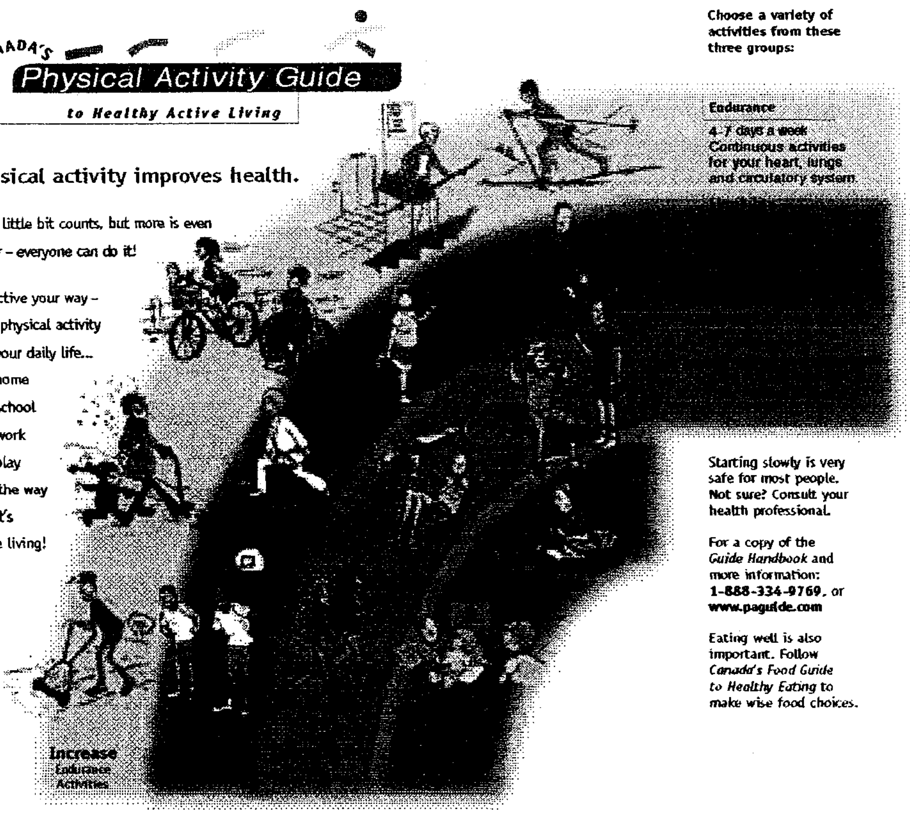
Physical activity improves health.

Every little bit counts, but more is even better – everyone can do it!

Get active your way – build physical activity into your daily life...

- at home
- at school
- at work
- at play
- on the way

...that's active living!



Choose a variety of activities from these three groups:

Starting slowly is very safe for most people. Not sure? Consult your health professional.

For a copy of the *Guide Handbook* and more information: **1-888-334-9769**, or **www.paguide.com**

Eating well is also important. Follow *Canada's Food Guide to Healthy Eating* to make wise food choices.

Get Active Your Way, Every Day–For Life!

Scientists say accumulate 60 minutes of physical activity every day to stay healthy or improve your health. As you progress to moderate activities you can cut down to 30 minutes, 4 days a week. Add-up your activities in periods of at least 10 minutes each. Start slowly... and build up.

Time needed depends on effort

Very Light Effort	Light Effort *60 minutes*	Moderate Effort *30-60 minutes*	Vigorous Effort *20-30 minutes*	Maximum Effort
• Strolling • Dusting	• Light walking • Volleyball • Easy gardening • Stretching	• Brisk walking • Biking • Raking leaves • Swimming • Dancing • Water aerobics	• Aerobics • Jogging • Hockey • Basketball • Fast swimming • Fast dancing	• Sprinting • Racing

Range needed to stay healthy

You Can Do It – Getting started is easier than you think

Physical activity doesn t have to be very hard. Build physical activities into your daily routine.

- Walk whenever you can – get off the bus early, use the stairs instead of the elevator.
- Reduce inactivity for long periods, like watching TV.
- Get up from the couch and stretch and bend for a few minutes every hour.
- Play actively with your kids.
- Choose to walk, wheel or cycle for short trips.
- Start with a 10 minute walk – gradually increase the time.
- Find out about walking and cycling paths nearby and use them.
- Observe a physical activity class to see if you want to try it.
- Try one class to start – you don t have to make a long-term commitment.
- Do the activities you are doing now, more often.

Benefits of regular activity:

- better health
- improved fitness
- better posture and balance
- better self-esteem
- weight control
- stronger muscles and bones
- feeling more energetic
- relaxation and reduced stress
- continued independent living in later life

Health risks of inactivity:

- premature death
- heart disease
- obesity
- high blood pressure
- adult-onset diabetes
- osteoporosis
- stroke
- depression
- colon cancer

Health Canada Santé Canada — Canadian Society for Exercise Physiology — Active Living

Source: Canada's Physical Activity Guide to Healthy Active Living, Health Canada, 1998 http://www.hc-sc.gc.ca/hppb/paguide/pdf/guideEng.pdf

FITNESS AND HEALTH PROFESSIONALS MAY BE INTERESTED IN THE INFORMATION BELOW:

The following companion forms are available for doctors' use by contacting the Canadian Society for Exercise Physiology (address below):

The **Physical Activity Readiness Medical Examination (PARmed-X)** – to be used by doctors with people who answer YES to one or more questions on the PAR-Q.

The **Physical Activity Readiness Medical Examination for Pregnancy (PARmed-X for Pregnancy)** – to be used by doctors with pregnant patients who wish to become more active.

References:

Arraix, G.A., Wigle, D.T., Mao, Y. (1992). Risk Assessment of Physical Activity and Physical Fitness in the Canada Health Survey Follow-Up Study. **J. Clin. Epidemiol.** 45:4 419-428.

Mottola, M., Wolfe, L.A. (1994). Active Living and Pregnancy, In: A. Quinney, L. Gauvin, T. Wall (eds.), **Toward Active Living: Proceedings of the International Conference on Physical Activity, Fitness and Health.** Champaign, IL: Human Kinetics.

PAR-Q Validation Report, British Columbia Ministry of Health, 1978.

Thomas, S., Reading, J., Shephard, R.J. (1992). Revision of the Physical Activity Readiness Questionnaire (PAR-Q). **Can. J. Spt. Sci.** 17:4 338-345.

For more information, please contact the:

Canadian Society for Exercise Physiology
202-185 Somerset Street West
Ottawa, ON K2P 0J2
Tel. 1-877-651-3755 • FAX (613) 234-3565
Online: www.csep.ca

The original PAR-Q was developed by the British Columbia Ministry of Health. It has been revised by an Expert Advisory Committee of the Canadian Society for Exercise Physiology chaired by Dr. N. Gledhill (2002).

Disponible en français sous le titre «Questionnaire sur l'aptitude à l'activité physique - Q-AAP (revisé 2002)».

Supported by: Health Canada Santé Canada

APPENDIX D

GENERAL HEALTH QUESTIONNAIRE
Health/Fitness Pre-participation Screening Questionnaire

The purpose of this study is to understand the impact of cardiovascular exercise on the experience of hot flashes/night sweats perceived by perimenopausal women. The purpose of this form is to ensure that the highest level of care is provided to you when conducting the current research study by obtaining specific information regarding your overall health and fitness. Please read and complete this questionnaire carefully.

The information contained in this form is considered confidential and will only be used to pre-screen potential participants.

Personal Information

Name: _____ Birthdate: _____

Height: _____ Weight: _____

Assess your health status by marking all the true statements.

History
Have you had:

_____ a heart attack
_____ heart surgery
_____ cardiac catheterization
_____ coronary angioplasty (PTCA)
_____ pacemaker/implantable cardiac device
_____ defibrillatory/rhythm disturbance
_____ heart valve disease
_____ heart failure
_____ heart transplantation
_____ congenital heart disease

Symptoms:

_____ You experience chest discomfort with exertion
_____ You experience unreasonable breathlessness
_____ You experience dizziness, fainting, or blackouts
_____ You take heart medications

If you marked any of these statements in this section, consult your physician or other appropriate health care provider before engaging in testing or exercise. You may need to use a facility with a **medically qualified staff.**

Other health issues:

_____ You have diabetes
_____ You have asthma or other lung disease
_____ You have burning or cramping sensation in your lower legs when walking short distances
_____ You have musculoskeletal problems that limit your physical activity
_____ You have concerns about the safety of exercise
_____ You take prescription medication(s)
_____ You are pregnant

Cardiovascular risk factors:

_____ You are a woman older than 55 years, have had a hysterectomy, or are postmenopausal

_____ You smoke, or quit smoking within the previous 6 months

_____ Your blood pressure is >140/90 mmHg

_____ You do not know your blood pressure

_____ You take blood pressure medication

_____ Your blood cholesterol level is >200 mg/dL

_____ You do not know your cholesterol level

_____ You have a close blood relative who had a heart attack or heart surgery before age 55 (father or brother) or 65 (mother or sister)

_____ You are physically inactive (i.e., you get <30 minutes of physical activity on at least 3 days per week

_____ You are >20 pounds overweight

If you marked 2 or more of the statements in this section, you should consult with your physician or other appropriate health care provider before engaging in testing or exercise. You might benefit from using a facility with a **professionally qualified exercise staff** to guide your exercise program.

_____ None of the above

You should be able to exercise or participate in testing safely and without consulting your physician or other appropriate health care provider in almost any facility.

Signature:_____

Date:_____

ACSM/AHA Joint Position Statement: Recommendations for cardiovascular screening, staffing, and emergency policies at health/fitness facilities. Med Sci Sports Exerc 1998: 1018; Guidelines for Exercise Testing and Prescription, 7th ed. Baltimore: Lippincott Williams & Wilkins, 2006:25.

APPENDIX E

INITIAL INTERVIEW GUIDE

1. What are your thoughts on growing older as a woman?
    - How do you see yourself growing older as a woman
    - Are you comfortable with getting older

2. What does the word 'exercise' mean to you?
    - What has been your experience with exercise in the past?
        - Was there a point in your life when you exercised regularly?
    - How do you feel about not exercising now?

3. What are your thoughts and feelings about entering menopause?
        - What have you heard about menopause from other people?

4. When did you first start noticing that you were having hot flashes?
        - How long has it been since you started having hot flashes?
        - Have they changed from before to now?
        - How often do you have them?
        - Do you notice any patterns when they occur or are they random?
    - Describe for me /walk me through the experience of a hot flash.
        - How do you know when you're about to have one – do you have any warning signs or feelings beforehand?
        - What about during a hot flash – what do you notice happens in your body?
        - What are you thinking about when you're having a hot flash?
        - What kinds of things do you do to cope with it?
        - When you experience a hot flash, how does it make you feel?
        - What happens to your body?

    - What types of strategies have you used to manage your hot flashes in the past e.g. drugs, herbs, diet etc.

5. Do you experience night sweats?
    - How does that compare to a hot flash that you experience during the day?
        - in terms of severity, how it makes you feel, and warning signs
        - What kinds of things do you do to cope with it?
        - Do they interrupt your sleep?
        - Do they occur as often as hot flashes do during the day?

6. How do hope to personally benefit by participating in this study?

7. Is there anything else you'd like to add that we haven't talked about?

APPENDIX F

FINAL INTERVIEW GUIDE

1. What are your thoughts on growing older as a woman?

2. Describe for me what the last 10 weeks have been like for you.

3. Has your experience of hot flashes and/or night sweats changed since the beginning of the study? If yes, how have they changed? How would you explain the change?

4. Did you notice any changes in symptoms other than hot flashes or night sweats?

5. What did you enjoy the most about participating in this study?

6. What did you enjoy the least about participating in the study?

7. In what ways has participating in this study impacted your life?

8. How have you personally benefitted from taking part in this study?

9. Tell me about your thoughts on recording your experiences in the journal. Did you find it beneficial?

10. What motivated you to complete the 10-week exercise class?

11. What type of adjustments did you make in your life in order to be able to attend the class?

12. Were there days that you weren't that motivated to attend the class? What did you do to overcome that?

13. How do you feel about exercise in your life today?

14. Now that you've finished the study, what are your future plans with respect to exercise?

15. Given your experience in this study, what advice could you give to other women who are experiencing hot flashes or night sweats?

16. Do you have any thoughts or comments to add about your experiences in this study?

APPENDIX G
WOMEN'S HEALTH ASSESSMENT SCALE

This questionnaire is about the body changes and symptoms occurring during midlife and associated with perimenopause. This questionnaire asks what symptoms associated with perimenopause you are **currently** experiencing or have experienced during the **last month** and how bothersome they are to you. This questionnaire is not about symptoms you had months ago.

NOTE: THIS QUESTIONNAIRE IS NOT ABOUT SYMPTOMS RELATED TO ANY MEDICALLY DIAGNOSED CHRONIC CONDITIONS YOU MAY HAVE (For example, chronic asthma, heart disease).

DIRECTIONS: The left column lists a variety of symptoms. Please read each symptom carefully and rate the frequency of the symptom in the middle column (Part A),

0 = never had,
1 = rarely,
2 = sometimes,
3 = often,
4 = always

and then how bothersome/distressful in the right column (Part B),

0 = not at all,
1 = a little,
2 = moderately,
3 = quite a bit,
4 = extremely.

Complete both columns before going on to the next symptom. If you never experience the symptom, you only need to complete Part A.

EXAMPLE: Ms. Smith (52 years old) has experienced DIZZY SPELLS sometimes which are quite bothersome and COLD SWEATS rarely which are not bothersome at all, but she has never experienced HOT FLASHES during the past month.

Symptom	Part A Have you experienced this symptom **in the course of last month?** 0 = never had, 1 = rarely, 2 = sometimes, 3 = often, 4 = always	Part B If you have experienced this symptom, how bothersome/ distressful was it? 0 = not at all, 1 = a little, 2 = moderately, 3 = quite a bit, 4 = extremely.
1. hot flashes	0 1 2 3 4	0 1 2 3 4
2. cold sweats	0 1 2 3 4	0 1 2 3 4
3. dizzy spells	0 1 2 3 4	0 1 2 3 4

Symptom	Part A Have you experienced this symptom **in the course of last month?** 0 = never had, 1 = rarely, 2 = sometimes, 3 = often, 4 = always	Part B If you have experienced this symptom, how bothersome/ distressful was it? 0 = not at all, 1 = a little, 2 = moderately, 3 = quite a bit, 4 = extremely.
1. hot flashes	0 1 2 3 4	0 1 2 3 4
2. night sweats (hot flashes that occur during sleep)	0 1 2 3 4	0 1 2 3 4
3. dizzy spells	0 1 2 3 4	0 1 2 3 4
4. lack of energy	0 1 2 3 4	0 1 2 3 4
5. diarrhea or constipation	0 1 2 3 4	0 1 2 3 4
6. irritability	0 1 2 3 4	0 1 2 3 4
7. restlessness	0 1 2 3 4	0 1 2 3 4
8. backaches	0 1 2 3 4	0 1 2 3 4
9. nervous tension	0 1 2 3 4	0 1 2 3 4
10. aches and stiffness in joints	0 1 2 3 4	0 1 2 3 4
11. upset stomach	0 1 2 3 4	0 1 2 3 4
12. headaches	0 1 2 3 4	0 1 2 3 4
13. rapid heart beat	0 1 2 3 4	0 1 2 3 4
14. shortness of breath	0 1 2 3 4	0 1 2 3 4
15. early morning wakening	0 1 2 3 4	0 1 2 3 4
16. sore throat or cold	0 1 2 3 4	0 1 2 3 4
17. "pins and needles" in hands or feet	0 1 2 3 4	0 1 2 3 4

Symptom	Part A Have you experienced this symptom **in the course of last month?** 0 = never had, 1 = rarely, 2 = sometimes, 3 = often, 4 = always	Part B If you have experienced this symptom, how bothersome/ distressful was it? 0 = not at all, 1 = a little, 2 = moderately, 3 = quite a bit, 4 = extremely.
18. leaking of urine when laughing or coughing	0 1 2 3 4	0 1 2 3 4
19. loss of appetite	0 1 2 3 4	0 1 2 3 4
20. fluid retention	0 1 2 3 4	0 1 2 3 4
21. forgetfulness	0 1 2 3 4	0 1 2 3 4
22. difficulty concentrating	0 1 2 3 4	0 1 2 3 4
23. bladder infection	0 1 2 3 4	0 1 2 3 4
24. loss of interest in things	0 1 2 3 4	0 1 2 3 4
25. lack of enjoyment	0 1 2 3 4	0 1 2 3 4
26. miserable and sad	0 1 2 3 4	0 1 2 3 4
27. decreased feelings of well-being	0 1 2 3 4	0 1 2 3 4
28. life not worth living	0 1 2 3 4	0 1 2 3 4
29. frightened /panicky feelings	0 1 2 3 4	0 1 2 3 4
30. anxiety leaving house alone	0 1 2 3 4	0 1 2 3 4
31. difficulty falling asleep	0 1 2 3 4	0 1 2 3 4
32. breast tenderness	0 1 2 3 4	0 1 2 3 4
33. bloated stomach	0 1 2 3 4	0 1 2 3 4
Symptom	Part A	Part B

		Have you experienced this symptom **in the course of last month?** 0 = never had, 1 = rarely, 2 = sometimes, 3 = often, 4 = always	If you have experienced this symptom, how bothersome/ distressful was it? 0 = not at all, 1 = a little, 2 = moderately, 3 = quite a bit, 4 = extremely.
34.	abdominal cramps	0 1 2 3 4	0 1 2 3 4
35.	feeling unattractive	0 1 2 3 4	0 1 2 3 4
36.	not lively or excited	0 1 2 3 4	0 1 2 3 4
37.	weight gain	0 1 2 3 4	0 1 2 3 4
38.	vaginal dryness	0 1 2 3 4	0 1 2 3 4
39.	decrease in sexual desire/interest	0 1 2 3 4	0 1 2 3 4
40.	painful intercourse (if you are not sexually active, please skip this row)	0 1 2 3 4	0 1 2 3 4
41.	dissatisfaction with sexual relationship (if you are not sexually active, please skip this row)	0 1 2 3 4	0 1 2 3 4
42.	menstrual bleeding more heavily	0 1 2 3 4	0 1 2 3 4
43.	menstrual bleeding more lightly	0 1 2 3 4	0 1 2 3 4
44.	period becoming further apart	0 1 2 3 4	0 1 2 3 4
45.	period becoming closer together	0 1 2 3 4	0 1 2 3 4
46.	menstrual bleeding lasting longer	0 1 2 3 4	0 1 2 3 4
47.	menstrual bleeding lasting fewer days	0 1 2 3 4	0 1 2 3 4
48.	Passing more clots	0 1 2 3 4	0 1 2 3 4
49.	Differing color/texture/odor	0 1 2 3 4	0 1 2 3 4

50. other (specify):	0 1 2 3 4	0 1 2 3 4

Do you attribute any of the symptoms directly to menopause phase of your life?

PERIMENOPAUSE/MENOPAUSE-RELATED QUALITY OF LIFE

How do you rate your overall perimenopause/menopause-related quality of life? Please circle a number from 1 to 10, with 1 meaning that your quality of life has been very poor and 10 meaning that your quality of life has been very good.

1	2	3	4	5	6	7	8	9	10
very poor quality of life								very good quality of life	

APPENDIX H

INSTRUCTION SHEET FOR SELF-REPORTED DIARY

This is your diary for you to keep and fill in for the entire duration of the study. I will be asking for you to return it directly to me at regular intervals throughout the study. Each time you return your diary to me, I will be photocopying the most recent excerpts from it and returning it promptly to you. Please be assured that I will be the only one handling your diary and the copies I make will be only be used for the purposes of this study.

There are two different types of information I would like you to include in your diary:

1) Specific information about the hot flashes and/or night sweats you experience on a day-to-day basis. This information will be recorded on the first page. I would like you to write down specific details about when you experience a hot flash or a night sweat. Include the time you experience the symptom, approximately how long it lasted, and rate how severe it is on a scale of 0 to 4 (0 = not at all, 1 = a little, 2 = moderately, 3 = quite a bit, and 4 = extremely). I would also ask that you write down any comments or observations you have about the hot flash/night sweat.

2) General information about your experience. This information will be recorded on the second page. I would like you to write about your experiences of participating in the exercise program such as how you felt about coming to the class, what motivated to continue, what you liked best about the class, and what you didn't like about the exercise class. I would also like you to write about the symptoms of perimenopause you have on that day and how they impact your life. That can also include describing not only your hot flashes but also such things as mood, energy levels, sleep patterns, headaches, joint aches or pains, or menstrual patterns.

Please feel free to write in any additional thoughts or comments you may have about your experiences.

This information is very important as it will help to provide me with insight into your thoughts and experiences as you go through the course of this study.

APPENDIX I

DAILY SYMPTOM RECORDING DIARY

Date:

Symptom: HF = hot flash NS = night sweat	Approximate Time:	Approximate Duration:	Severity: 0 = not at all 1 = a little 2 = moderately 3 = quite a bit 4 = extremely	Comments or Observations:

PAGE TWO

Please use this space to write about your experiences today and how they impacted your life. Here are some ideas to reflect on:

- Comments about any symptoms you may experience such as hot flashes/night sweats, your mood, energy levels, sleep patterns, headaches, joint aches or pains, menstrual patterns.

- If today was a day you took part in the exercise class, please write about your experiences in the class. What type of adjustments did you make in your life in order to be able to regularly attend the exercise classes? What has motivated you to continue to exercising?