PREDICTORS OF PHYSICAL ACTIVITY AMONG WOMEN IN GENESEE COUNTY BETWEEN THE AGES OF 40-60

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TABLE OF CONTENTS

Abstract

This pilot study explored factors that Flint area women, between the ages of 40 and 60, cited as influencing their daily physical activity. Better understanding of factors that influence physical activity may lead to more appropriate and effective health promotion messages and programs.

In depth interviews were carried out with fifteen women between the ages of 40 and 60 in Genesee County. Qualitative theory guided the interview process and data analysis. Recurring themes from interviews were identified and categorized using the ecological model.

Although subjects identified influences on their exercise behavior within each of the five levels of the ecological model (intrapersonal, interpersonal, institutional, community or public policy), women most often cited institutional supports when suggesting ideas for activity promotion. Interventions on the institutional level, such as work-site health promotion, may be most successful to increase physical activity among this cohort.

Introduction

A majority of women do not participate in recommended levels of exercise even though documentation of the health benefits of physical activity are numerous (Ettinger et al, 1997; Byrne & Byrne, 1993; Hill et al, 1993; Shumway-Cook et al, 1997; Thune et al, 1997; Pate et al, 1995). Women between the ages of 40 and 60 may experience physical and life-style changes that differentiate this group from younger or older women, which may affect participation. Understanding potential factors that may hinder or promote physical activity among middle-aged women could assist health educators in developing

more appropriate strategies to increase physical activity patterns and ultimately enhance health outcomes among this group.

This investigation will address the following question:

Research Question

What factors do women between the ages of 40 and 60 in Genesee County cite as influencing their level of physical activity?

Literature Review

The physiological and psychological benefits of physical activity for older adults are well documented. (Byrne & Byrne, 1993; Hill et al, 1993; Shumway-Cook et al, 1997; Thune et al, 1997; Pate et al, 1995). Those who regularly exercise are more likely to live longer and have a decreased risk for cardiovascular disease, osteoarthritis, breast cancer and diabetes. (Kushi et al, 1997; Mayer-Davis et al, 1998; Ettinger et al, 1997; Hill et al, 1993). Those who are active also enjoy better psychological function, balance, and mobility (Byrne & Byrne, 1993; Shumway-Cook et al, 1997).

Numerous studies document the relationship between lower levels of physical activity and poor health outcomes (CDCP, 1994; Hill et al, 1993; Kushi, et al, 1997; Paffenbarger, et al, 1986). With life expectancies rising, adults can expect to spend a greater percentage of their lives as older adults in comparison with past generations.

Older women who incorporate regular physical activity into their lives are more likely to live longer and have less morbidity (Kushi et al.1997). Physical functioning in

adults with chronic conditions such as osteoarthritis improves with long term exercise (Ettinger et al, 1997). Despite this fact, 31% of women can describe themselves as sedentary, when surveyed reporting no leisure time physical activity in the previous month (Pate et al., 1995).

Many investigations have attempted to discover predictors of physical activity and recommend interventions and environments in which opportunities for physical activity are enhanced (Patterson, et al, 1988; Russell, et al, 1999; Sallis, et al, 1986; Hofstetter, et al, 1990; Hovell et al, 1989). Social support, health knowledge, gender and age have been shown to be strong predictors of both current levels of activity and future exercise behavior (Wallston & Wallston, 1978; Hofstetter, et al, 1990; Hovell, et al, 1989). Health locus of control, the belief that one's health is controlled by internal or external factors, also impacts behavior and health outcomes (Wallston & Wallston, 1978). Reasons that older adults cite for their lack of physical activity include lack of time, injury, negative peer pressure, financial cost, safety concerns and the belief that exercise has little value (Ferrini & Ferrini, 2000).

Even though there has been much attention to the study of physical activity, much of the literature deals only with measurement or issues surrounding recommendations for health risk reduction without exploring ideas for behavior change (Sallis & Owen, 1999; Hill et al, 1993; Kushi et al, 1997; Mayer-Davis et al, 1998; Thune et al, 1997). For example, the Centers for Disease Control and the American College of Sports Medicine defined recommendations for physical activity for US adults. Although categories of

sedentary, somewhat active, and active were described recommendations for encouraging behavior change was not addressed (Pate et al, 1995).

Sallis and Owen (1999) review a number of studies that have contributed to the current understanding of physical activity determinants in specific groups. Although many studies have been carried out among sub-groups with children, adolescents, families, communities, patients with clinical conditions, older men, older women, and the elderly, there is a lack of literature that address physical activity issues specifically in regard to women who are between the ages of 40 and 60.

Women aged 40-60 may have unique concerns and needs that are not being addressed (Sallis & Owen, 1999). Physical symptoms due to hormonal changes associated with menopause may influence women's activity levels (Kushi et al, 1997). Adjusting to children leaving the home or changes in marital status may also impact women in their middle years. Changes in employment may accompany the middle years and influence physical activity levels. Living in a culture that glorifies youth and physical beauty may inhibit aging women from feeling comfortable in swimsuits or other clothing associated with exercise.

Since women have a longer life expectancy than men and are less likely to exercise than men (Pate et al., 1995), new information will be useful to expand the collective knowledge on physical activity predictors for this specific group. If effective ways to promote physical activity in women aged 40-60 were known and employed, gains in quality of life, physical and psychological functioning would improve women's lives. Health care costs may also be reduced among this cohort.

Qualitative Approach

Qualitative methodology was chosen to guide this interview process since it allowed subjects the freedom to contribute very specific and personal information to the discussion of physical activity participation. The qualitative research approach has been described and promoted by many authors. According to Anselm Strauss:

> "Qualitative methods of data gathering have gained popularity over the years...it allows for findings not arrived at by statistical procedures or other means of quantification. It can refer to research about persons' lives, lived experiences, behaviors, emotions, and feelings as well as about organizational functioning, social movements, cultural phenomena, and interaction between nations" (Strauss & Corbin, 1998).

Qualitative research evolved as a method of organizing and analyzing information that might seem subjective in nature. (Glaser and Strauss, 1967). Qualitative methods are particularly appropriate when a relatively small number of in-depth interviews are being analyzed.

Maxwell (1996) explains that the qualitative approach is best suited for the following five particular research approaches:

1. Understanding the meaning for participants in the study of the events, situations, and actions they are involved with, and of the accounts that they give of their lives and experiences.

2. Understanding the particular context within which the participants act and the influence that this context has on their actions.

3. Identifying *unanticipated* phenomena and influences, and generate new grounded theories about the latter.

4. Understanding the *process* by which events and actions take place.

5. Developing *causal* explanations.

Ecological Theory:

Along with the qualitative approach, the present pilot study will be guided by ecological theory. The ecological model was first introduced in 1988 (McLeroy et al, 1988). It proposed looking beyond individual behavior change when addressing health promotion. The ecological model takes social influences into account along with individual factors as determinants of behavior.

Unlike Social Learning Theory or the Health Belief Model, (Rosenstock, et al, 1988), which focus on individual learning for behavior change, the ecological perspective incorporates a broader range of factors that may influence behavior, such as physical environments and governmental policies.

The ecological model highlights multiple levels, both personal and environmental, that influence behavioral decisions, making it an appropriate tool to explore the many influences on exercise behavior (Green et al, 1999). Instead of an assumption that behavior is a product only of individual decision-making, ecological model interventions directed at changing interpersonal, interpersonal, institutional/organizational, community and public policy factors, stand to be more successful at addressing factors that discourage or support and maintain unhealthy behaviors.

Increasingly, the importance of environmental and policy intervention perspectives are being suggested along with individual behavior change strategies in physical activity literature to promote sustainable positive change (King, 2001). The

environmental model provides a framework for researchers to identify the most important moderators of change and more importantly, for whom and under what conditions those behavior change interventions work (King, 2001).

Transtheoretical model:

The stages of change (transtheoretical) model that Prochaska and DiClimente first described in 1983, holds that in order to bring about behavior change it is important to first determine at what stage an individual starts in terms of readiness (Prochaska & DiClimente, 1983; Glanz et al, 1997). First proposed for use in addiction treatment, this theory has been adapted to a number of behavior change interventions including readiness to begin physical activity. Although the transtheoretical model first described change as linear through stages of precontemplation, contemplation, preparation, action and maintenance, the theory has evolved to one that treats behavior change as more dynamic as opposed to being static (Marshall et al, 2001). It is now believed that people may go back and forth among the stages of change instead of following a linear course.

A recent meta-analysis of applications to physical activity and exercise using the transtheoretical model of behavior change uncovered 71 published reports on physical activity using trantheoretical model constructs (Marshall et al, 2001). Results generally supported the use of the transtheoretical model in activity research, but Marshall recommended going beyond categorization of participants into groups according to the stages of change and towards examining moderators and mediators of change (Marshall et al, 2001).

Coupling transtheoretical theory with the ecological model may uncover some mediators of change. For example, if a woman contemplating daily walking, moved to a neighborhood in a low-crime area, safety may be a factor that mediates her change into the preparation or active category. In this example the person would first be categorized by the transtheoretical model as a **contemplator** changing to the **preparation** or **action** stage. By also acknowledging the **environmental community** change, the reason for her change in activity is explained and better understood.

By acknowledging that people are at different levels of activity and live in varying environments, programs can be tailored to the needs of individuals. Since the transtheoretical approach is used for individual behavior change, it will be used only in the micro levels of the ecological model.

Methodology

In order to explore the reasons women between the ages of 40 and 60 give to explain their level of activity; fifteen one-on-one interviews were conducted in the Flint community. Two of the interviews were not included in analysis due to a technical problem. Criteria for participation included being a woman between the ages of 40-60, and living in Genesee County. Criteria-based selection is often used in qualitative studies in order to select particular persons, settings, or events that fit study eligibility criteria (Maxwell, 1996).

A five-dollar gift certificate to a Borders bookstore was offered to volunteers who completed the interview as a token of appreciation for their time. After fifteen interviews were completed, it was apparent that a saturation point had been reached and no new information had emerged from the later interviews (Strauss & Corbin, 1999).

Volunteers received information on confidentiality before the interview along with a written consent that they were asked to review and sign. After written consent was obtained, a thirty-minute interview was conducted. A conversational method was employed throughout the interview, allowing subjects to openly describe their lifestyle relating to physical activity. Interviews were taped and transcribed verbatim. (See Appendix A for interview questions).

The methodology of semistructured interviewing (Russell, 1994) was used in order to retain the open-ended quality of the interview, while guiding conversation to address important topics.

All participants were questioned about their current level of physical activity along with a history of activity from their childhood, around puberty, and young adulthood. All women were also asked if their doctors ever brought up the subject of physical activity. They were also questioned about their knowledge of current recommendations for physical activity for healthy women of their age group. Further, all participants were asked about their contentment with their body size and shape.

Women were encouraged to speak freely, but were guided by questions that encouraged consideration from each of the levels of the ecological model. For example, in order to encourage a women to consider the impact that living in the Flint community may have on her level of physical activity, the following question was asked: "Can you think of anything in the community where you live that would promote or discourage you from being active?" Answers such as "high crime rate" or "lack of bike paths" would be categorized within the community level of the ecological model.

After all interviews were completed, analysis of the data was undertaken. Interviews and tapes were reviewed and observational notes were considered. Cues in the typed transcripts helped to show which word subjects emphasized and when pauses or laughter occurred. If a word was emphasized the word was typed in capital letters. If a subject rolled her eyes or made a physical gesture that could have been missed in verbal dialogue, it was included in parenthesis. An example of the importance of non-verbal communication was presented in one of the early interviews. When the subject spoke of her job not allowing her to be physically active she rose from her seat, pointed to her rear and laughed. That gesture was noted on the typed transcript.

Subjects were categorized according to one of three activity levels by collapsing the 5 stages of change from the Transtheoretical Model into 3 activity levels; sedentary, somewhat active and active (Table B-1).

Activity Level Definitions

1. "Sedentary = reports no sessions of vigorous physical activity."

The stages of change groups incorporated into the sedentary designation are precontemplation and contemplation and preparation. Precontemplation refers to those who never considered changing a particular behavior, and contemplation to those who express a desire to change, but have not yet put a plan for change into action. Those in the preparation stage are making plans to change. In the area of physical activity, they may be seeking out health club membership, making plans with a neighbor to walk or buying a bicycle.

2. "Somewhat active = participates in 1 or 2 thirty minute sessions of vigorous physical activity weekly."

The stage of change included into this group is the action stage. People in this stage may have just started to exercise, but have not yet been active for a period of four weeks. They also may have been previously active, but have not lately had more than two sessions of activity in the last several weeks.

3. "Active = takes part in at least 3 or more 30 minute sessions of vigorous physical activity weekly."

The maintenance stage of the transtheoretical model is represented by this category. Interviews were again reviewed to find reoccurring themes to explain activity or lack of activity. Reasons were then categorized within an ecological framework to identify where intervention strategies might best be focused.

The five levels of the ecological model (McElroy et al, 1988) are followed by a short explanation of how each of the stages was conceptualized to facilitate coding of interviews:

1. "Intrapersonal Factors: Individual characteristics that influence behavior, such as knowledge, attitudes, beliefs, and personality traits."

For example, an overweight woman who has a history of asthma and negative experiences with sports as a child may be less inclined to be active as an adult.

Table A-1. Intrapersonal Factors

1. *Perception of Overall Health Status*
2. *Current Health Conditions (Co-Morbidities)*
3. *Activity History from Childhood and Young Adulthood*
4. *Level of Education, Income, Race*
5. *Satisfaction with Body Image*
6. *Beliefs, Knowledge, and Attitudes about Fitness*
7. Perception of Control

Intrapersonal factors are presented in Table A-1.

2. "Interpersonal Factors: Interpersonal processes and primary groups including family, friends, and peers that provide social identity, support, and role definition."

Social supports may include having women to walk with or tennis partners. Table A-2 lists interpersonal factors.

Table A-2. Interpersonal Factors

1. *Marital Status*
2. *Family Support or Lack of Support*
3. *Abused by a Partner or Family Member*
4. *Support from Co-workers or Friends*
5. Support/Advice from Health Care Providers

3. "Institutional/ Organizational Factors: Rules, regulations, policies, and informal structures, which may constrain or promote recommended behaviors."

Example: A workplace that offers employees morning and afternoon breaks may make it possible for workers to fit two brisk walks into their work day. However, strict dress codes or lack of a place to change into more comfortable clothing may inhibit physical activity in the workplace. Table A-3 lists institutional/organizational factors.

Table A-3. Institutional/Organizational Factors

1. *Institutionalized Gender Bias*
2. *Work Environments*

4. "Community Factors: Social networks and norms, or standards, which exist as formal or informal among individuals, groups, and organizations."

Example: Living in a high crime neighborhood may discourage residents from walking or jogging outside. Also, community factors that influence activity may be found in specific religious practices. For instance, Muslim women are encouraged to keep their bodies covered by modest dress. Wearing a bathing suit in a public pool may be culturally unacceptable, so swimming may not be an exercise choice for that group.

Table A-4. Community Factors

1. *Community Programs and Resources*
2. *Safety Factors*
3. *Weather Issues*

5. ***"Public Policy: Local, state, federal policies and laws that regulate or support healthy actions and practices for disease prevention, early detection, control and management."***

Example: A local ordinance that mandates provision of bike paths may make is easier for residents to incorporate physical activity into their lives.

Dialogue from interviews was color coded into five categories, providing a method of organizing and extracting information. Same color-coded responses were looked at as one group representing each stage. Dialogue within each category was analyzed to identify common themes. An effort was also made to preserve the context in which comments were made. For example if a woman was asked about satisfaction with body image and she said in a sarcastic tone " I'm really content with my perfect body!" her sarcasm was noted in the transcript.

Results

Subjects will first be described according to activity level. Results are presented using the collapsed categories from the transtheoretical model as previously described on page 10-11. Results will then be discussed according to ecological model categories.

Current Activity Level:

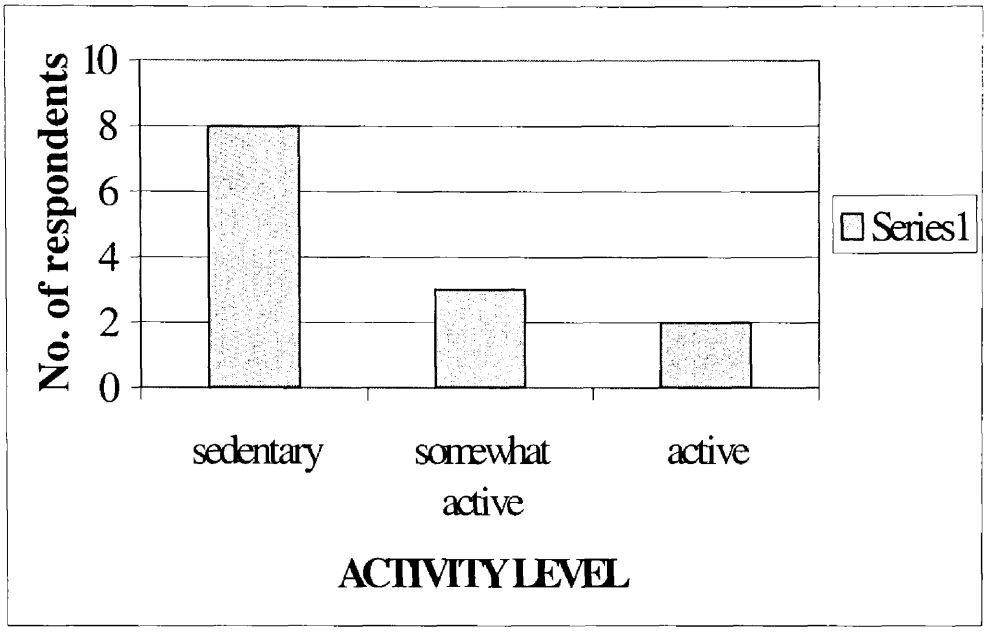
Subjects were questioned about activity levels during childhood, teen years, and young adulthood in addition to their current level of activity. However, only levels of activity reported for the four weeks prior to the interview of activity were considered to determine if they were sedentary, somewhat active, or active.

Over half of the respondents (8 of 13), reported no sessions of vigorous physical activity and were categorized as sedentary (Table B-1 and Figure B-1).

Table B-1. Activity Levels

SEDENTARY	**SOMEWHAT ACTIVE**	**ACTIVE**
Precontemplation = 0	Action = 3	Maintenance = 2
Contemplation = 8		
Preparation = 0		

Figure B-1. Current Physical Activity Levels



None of the eight "sedentary" could be described as precontemplators. All reported considering incorporating vigorous activity into their lives at some point. Further, none could be described in the preparation stage, since it was not evident that any of the seven were engaged in making specific plans to begin a program of physical activity. Some spoke in general terms of wanting to become more active once they retired, or after their lives became less stressful, but no specific time-based plans were outlined. All eight in the sedentary group could be described as contemplators by the transtheoretical model.

Three subjects reported levels of activity that fit the "somewhat active" category. One of the three subjects in this group had suffered a tendon injury and reduced her activity while it healed. One subject was had recently joined an exercise group and participated in a weekly one hour session of vigorous activity. The third subject had been

active at other times during her life, and reported currently taking part in up to one hour a week in vigorous activity, but did not meet criteria for the active category.

Two of the respondents fit the criteria for the active group. One of the women reported going to the gym five days a week for one hour of vigorous activity each visit. The other reported running several miles on most days.

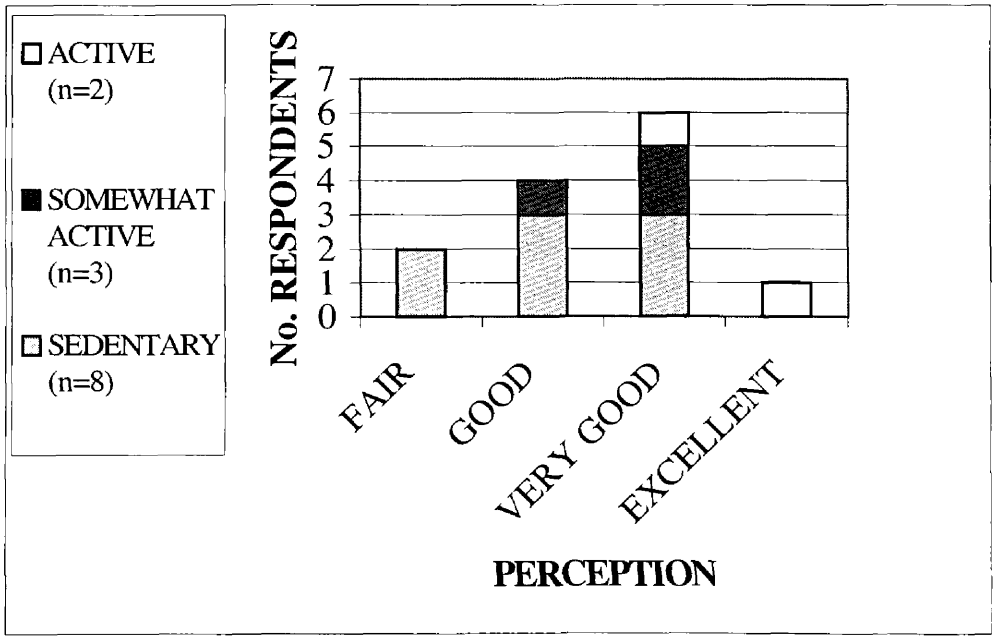
Intrapersonal Factors:

Information that categorized in the intrapersonal factors revealed the following intrapersonal themes:

1. Perception of Overall Health Status

Subjects were asked to rate their health status and whether they had any health conditions that interfered with their ability to be active. Most of the respondents described their health as good or very good. Two felt their health was only fair and two answered "excellent". (Figure B-2)

Figure B-2. Respondent's Activity Level by Perception of Health Status



2. Current Health Conditions (Co-Morbidities)

Half of the respondents in the "sedentary" group (4/8) cited chronic health problems as interfering with their ability to exercise. Raynauds disease, Meniere's disease and pain from adhesions were mentioned. Another woman from the sedentary group reported that her health problems interfered with her ability to be active, but was unable to specifically cite any current health problems. Instead, she gave a detailed history of being a sick baby, having a tonsillectomy and appendectomy at an early age.

As mentioned previously, a woman in the "somewhat active" category reported a tendon injury that interfered with her ability to be active. But, none of the 3 women in this category reported any chronic health conditions. Both of the women in the "active" group initially reported that they had no health conditions that interfered with their ability to exercise. However, one respondent hesitated after answering, and later indicated she might be damaging her knees from running and is starting to experience pain.

3. Activity History from Childhood and Young Adulthood

Subjects were asked about their levels of activity as children, teens and as young adults. This question evoked long responses. Women recalled childhoods that included swimming, bike riding, and farm chores. Initially, most said they were 'very active' as children, however, a description of their specific activities according to previously presented categories, indicates that 'somewhat active' would more closely describe their level of activity. For instance, one who reported being very active described swimming. However she said her parents took her to the beach only three or four days each summer.

Three subjects said they were sedentary as children. One lived in the country and didn't have other children to play with. Another said she liked staying in the house during summer vacation and did a lot of reading while her parents were at work.

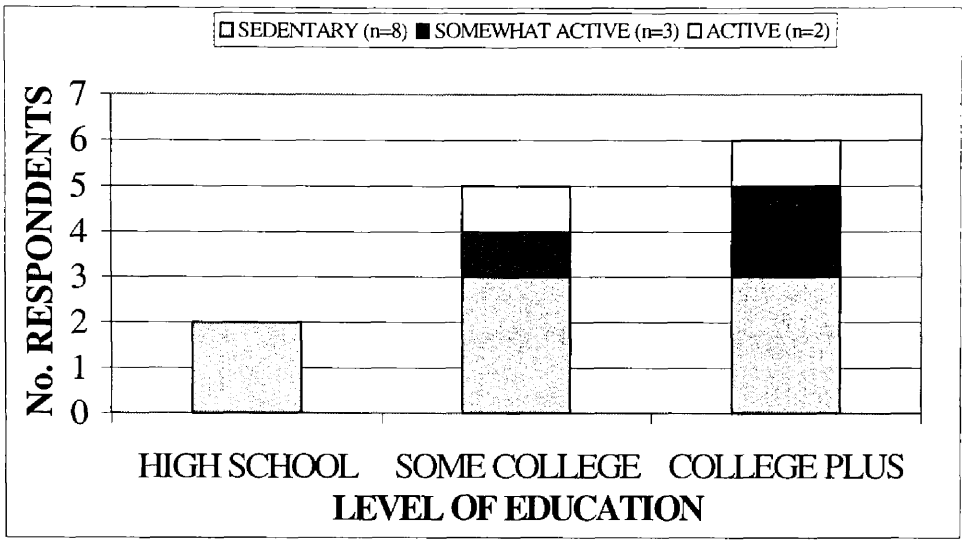
There was little variation in their activity during childhood. All were either sedentary or moderately active. The responses to questions concerning women's activity levels during young adulthood did not vary much. Most either reported very little change from their moderate or sedentary activity levels of childhood. However, many thought that chasing young children kept them somewhat active. The two women interviewed who are now physically "active" both reported that they started programs of physical activity during their years as a young adult. That was a change from the moderate activity levels both had reported during their childhood years. Two others mentioned trying out new physical activity experiences like skiing, and jogging during their college years.

4. Level of Education, Income and Race

Six of the respondents reported having a masters degree or education beyond their masters degree which will be referred to as "college plus". Five had some college but did not finish (some college). Two were high school graduates (high school).

One of the women in the active group had completed her doctorate so was categorized as college plus . The other had some college education. Two of the three women in the somewhat active group reported having a "college plus" level of education. The third fit the "some college" category. In the sedentary group, three had "college plus", three had some college and two were high school graduates (Figure B-3).

Figure B-3. Distribution of Activity Level by Level of Education



Seven women reported household incomes over $50,000 per year. The remaining five reported their household income as less than $50,000. Both women in the 'active' category reported incomes over $50,000. Two of the women in the 'somewhat active' group had incomes of over $50,000 per year, while the third reported an income of less than $50,000. Five of the women in the inactive group reported incomes of less than $50,000 a year. The remaining three had category reported incomes over $50,000 per year.

All but one respondent identified their race as white or Caucasian. One women identified herself as half white and half Native American.

5. Satisfaction with Body Image

Virtually all women interviewed expressed dissatisfaction with their body image, or size as illustrated in the following quote:

> "Satisfied with my body? Ya, right! (laughter) I'd like to be about 25 pounds thinner. And I'd also like to rearrange some of my fat.

> If I could just take some from my thunder-thighs and move it to my chest (pause) and face...Ya, that would be an improvement."

However, the women classified as sedentary were more likely to mention being unhappy with their weight than the women in the 'active' or 'somewhat active' groups. The more active women were more satisfied with their weight, but complained more about the shape of their bodies. Many mentioned specific "trouble spots". Most often women were dissatisfied with heavy thighs or what they perceived to be "pudgy bellies."

"My weight never changes much so I guess that part is O.K., but I've never really had toned thighs even with all the running I do. Another problem area has always been my tummy."

6. Beliefs, Knowledge and Attitudes about Physical Fitness

Many of the women in the sedentary group interviewed believe that they don't have enough time to exercise, or that they are too stressed to exercise. Most expressed that they thought they would feel better if they exercised, but also have the belief that taking part in physical activity is boring.

> "I know I would feel better if I got in some exercise. I have in the past. But by the time I get home from work I just want to relax. I have to use what little time I do have to get my clothes ready for the next day and all the other stuff. I guess I feel like I deserve some down time too, like a reward. So I'd rather watch TV or read instead of walking on the treadmill. That just isn't too attractive after a hard days work."

Several of the women who expressed a desire to lose weight acknowledged that activity is touted as important in weight reduction. However, they didn't seem to believe

that it really makes much difference in their own personal attempts to lose weight. Many thought that diet was a far more important factor in weight loss and weren't likely to incorporate physical activity into their weight loss attempts.

> "Every time I try to lose weight, I end up going back to Weight Watchers and they have you keep a diary of what you eat and how much you exercise. I always keep the food record faithfully if I'm serious of weight loss, but I've never paid much attention to the exercise . I guess when I have it never seemed like I lost any faster."

Three women from the sedentary group believed lack of money keeps them from being physically active. They felt as though having the resources to join a gym or hire a personal trainer would motivate them to be more physically active.

> "I'm sure if I were rich like Cher and could have a personal trainer come to my house keeping fit would be a breeze.."

There was a marked difference in attitude toward activity between the sedentary and more active groups. The sedentary women felt like they were already burdened with too many things to do and that exercising would be just one more burdensome thing to fit into their schedules. The women in the 'somewhat active' and 'active' groups were more likely to think of physical activity in a positive light. They tended to think of activity as a bonus rather than a burden. One woman from the 'active' group expressed her positive attitude:

> "...it's a matter of getting my heart working, and getting into a rhythm. Then it just feels good. I can't really describe it. It's like a high. And it (the feeling) lasts long after I stop running. It lasts for the rest of the day. If I don't run, I feel lazy and sluggish all day. Even my mood is worse."

Several of the women in the sedentary group had a defeated attitude when it came to including physical activity into their lives. While expressing that they would like to be physically active, and are knowledgeable about many of the health related positive effects of exercise, they didn't believe they were capable of incorporating physical activity into their lives. Several felt that it would be unlikely that they could change at this point in their lives.

> "For years I always made a New Years resolution to get fit. But I haven't done that in awhile. If it ain't happened yet, what are the chances it will?"

One common theme involved respondents' knowledge of recommendations for physical activity. None of the women interviewed felt confident that they knew the recommended levels of activity. All expressed confusion and felt that the recommendations are not well publicized. Many felt that the recommendations change often, and they can't keep up with the current guidelines.

> "I think its a half hour, no maybe an hour five times a week.....or is it three times a week? I'm really not sure. I think it's changed again during the last few years. It seems like it used to be 20 minutes....of heavy....or aerobic...I'm not really sure."

However, every woman interviewed was able to list several benefits of being physically active. Those identified benefits included "feel better physically and mentally, having more energy, looking better, increasing bone density, and relieving stress."

7. Perception of Control

Issues of control came up during the interview. After reviewing the completed interviews, a crude determination of perception of control was made. Respondents were

sorted into one of two groups. Women who expressed that they felt in control of their lives and capable were categorized as high perception of control. Women who expressed feeling unable to implement change in their lives were deemed low in control. A parallel could then be drawn between level of control and activity level.

One women expressed that she felt unable to control things in her life. She seemed to feel that she was always a victim of circumstances. She was assigned a low control status.

> "My son is always going to be around. You can't divorce your kids. He's never going to change and I'm always going to have to deal with him."

The following excerpt illustrates the kind language that was considered in making a determination of high perception of control.

> "I've always been really good about getting routine care like mammograms. ...I do pap smears on a regular basis. I get my eyes checked, and I go to, you know, the dentist. Basically, I sort of feel like I'm in charge of my medical care...in terms of....I feel like I should be paying attention if something isn't working. Because to turn it over to somebody else doesn't really work."

All but three of the women interviewed displayed high levels of perception of control. The three remaining women from the sedentary group exhibited low control.

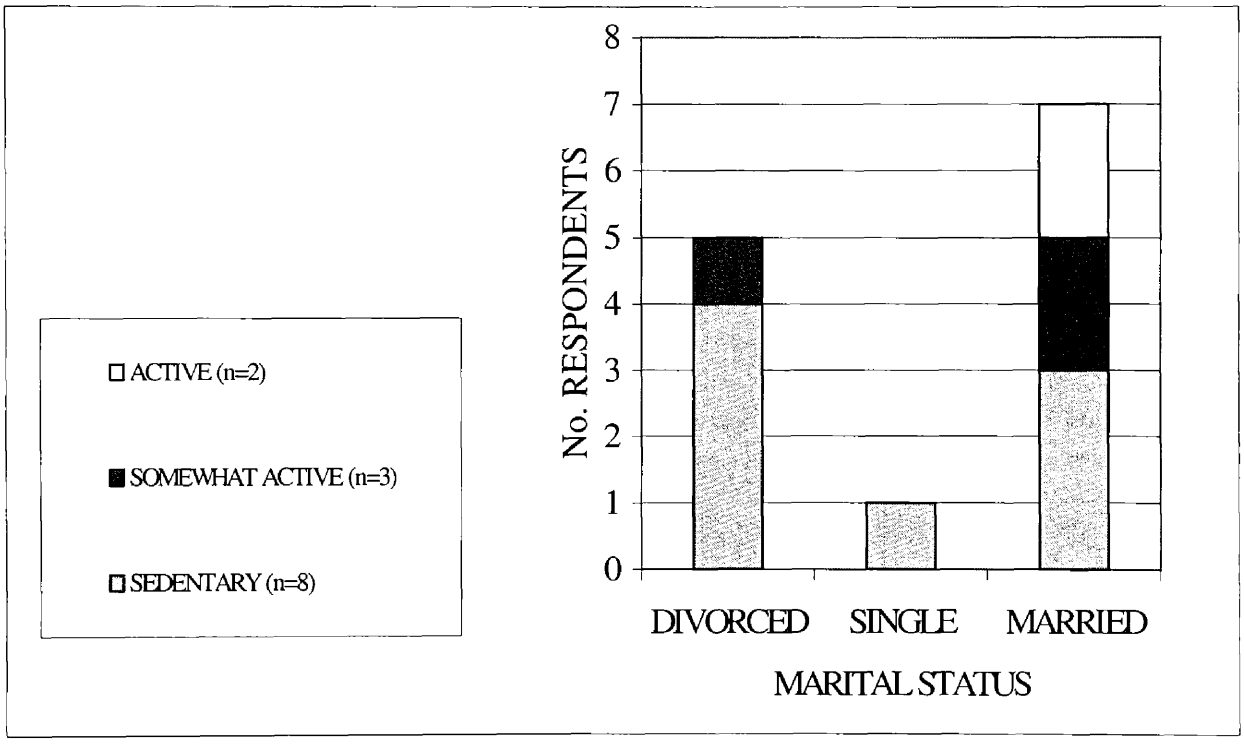
Interpersonal Factors

Social support factors were considered under the category of 'intrapersonal' in the ecological model. Themes emerged in the following categories:

1. *Marital Status*

Seven subjects were married, five were divorced and one identified herself as single. Both women in the active group reported being married. Two of the women in the somewhat active category were married and one was divorced. Of the eight women in the sedentary group, three were married, four were divorced and one single (Figure B-4).

Figure B-4. Distribution of Activity Levels by Marital Status



2. Family (or Partner) Support or Lack of Support

While several women felt that family obligations discouraged them from being physically active in the past, none felt that they were currently being discouraged by

family members, a partner, or family obligations to be active. Most of the women interviewed reported that the active years of raising a family were behind them.

> "It's really easier than ever for me to get out and walk. I don't have to worry about leaving my kids alone or or helping them with homework or anything anymore."

Even though being married appeared to be correlated with higher activity levels, neither of the active women exercised with their husbands. However, they felt that their partners were generally supportive of their exercise regimes.

> "My time to exercise is my own. I don't like to go with anyone else, even my husband. I think he understands that....he knows me pretty well by now. He's glad that I have my time. I think he knows that I'm happier when I get my exercise in so he's all for it."

3. Abused by a Partner or Family Member

History of physical abuse is a theme that came up unexpectedly. Three women brought up the issue of physical abuse, when speaking of intrapersonal relationships. Former husbands abused two of the women. Both expressed a desire to feel strong in order to defend themselves. One of these women was classified as 'somewhat active' and the other, 'sedentary'.

> "I think the biggest reason I started going to the gym after my divorce was to get strong. I felt like I needed to be strong so I would never be in a situation where I feared for my life again. I was always afraid to fight back because I knew he would just overpower me. Sometimes I wish I just would have had the courage to kick him in the balls....and then it upset me that I was becoming violent too."

Another woman suffered abuse at the hands of a troubled teenage son. She felt that she would always be incapable of defending herself against an abusive man no matter how physically fit she became. This woman was in the sedentary category.

> "What do you do when it's your own kid who's hitting you? If you call the cops, you just end up dealing with your kid going to jail. You can't press charges when it's your own son. There's no way I can physically defend myself against him and he knows it."

4. Support from Co-workers or Friends

Seven of the eight sedentary women felt that having someone to walk or exercise with would make it more likely that they would maintain a program of physical activity. This finding is consistent with a study by M. Hovell et al, (1989), which showed that social support was a strong motivator for sedentary adults to take up walking for exercise. One of the women in the 'somewhat active' category felt like an exercise buddy would be beneficial. The two other women in this group, along with the two women in the 'active' category did not think having a partner be active with was important. However, they thought that it might be useful to other women who are trying to get motivated to adopt a program of activity.

One woman, who is now an avid runner described the influence of a peer in the following manner:

> " That's (college years) when I started getting interested in running. I had a roommate who was always jogging.... I started jogging with her, mainly so she wouldn't be alone. Before long I was liking it more than she was. I'd actually bug her to join me..... I've never really stopped since then. .....Now I would rather run alone. In fact, it's not really comfortable to run with

> other people at this point, because I have my own sort of routine, and I don't like it interrupted. And I HATE having to wait for someone!"

It may be noted that while this woman's personal history which includes college running may be categorized under the interpersonal category, it also illustrates the influence of social support and could be included under intrapersonal as well.

5. Support/Advice from Health Care Providers.

Women were asked if their doctor inquired about their level of physical activity or gave them advice in regard to diet or exercise. More than half of the women (7) answered "no."

> "It doesn't really come up. I get the impressions he's trying to get out of that room as fast as he can. He's always writing in my chart if I'm talking to him so I don't feel like he really wants to carry on a conversation.

Of the six women whose doctors had discussed diet or exercise, most said that it was brought up in the context of weight reduction. One of these women was unsure whether he was the one who brought up the subject, or if she did. She added that her physician was more likely to ask <u>her</u> advice on how to get motivated to exercise than to offer advice.

> "Yes my doctor talks about exercise....well, actually I think I might bring it up. He's pretty overweight so maybe he doesn't feel comfortable giving advice. He's always asking me what me secret is for keeping motivated to exercise."

None of the woman mentioned that they were working closely with their doctor on a program of fitness or diet, and if those issues were mentioned at all, they were discussed in a very general way with little time was devoted to it. None of the women

expressed that advice from their health care provider was a factor that motivated them to seek out opportunities to incorporate physical activity into their daily living.

Institutional or Organizational Factors

Topics that emerged under the institutional /organizational category included institutionalized gender bias, and work environments.

1. Institutionalized Gender Bias

When women spoke of their pattern of activity over their lifetime, school experiences came up often. Many women reflected on the lack of opportunity for physical activity within the educational setting. Experiences with physical education were often perceived negatively.

When recalling childhood activity levels the issue of gender came up often. Many spoke of the lack of organized sports available to girls during the 1950's and 1960's. The following quote from one respondent illustrates the common observation of unequal opportunities for girls.

> "I remember from way back to the beginning of school. I mean truly, from that time, you (girls) couldn't participate in the same sports, you know, in school and all the way up. ...they didn't have the equal sports laws that came into effect that you had to have equal teams....."

Another respondent expressed that at the time she was growing up she felt that being very active was perceived negatively. She said that she stopped playing football and basketball with her brothers around the time of puberty for that reason.

> "I guess it seemed, well, not very feminine. And I think there was sort of a stigma to a girl participating in sports. Like it was sort of a low class thing. My parents, my mom anyway was concerned about those things. I did like to run and even

> considered going out for track but my dad was against it. He said his reason was that I should come home and help my mother with dinner and my younger brothers, but I know he always thought that girls who developed muscles in their legs looked masculine. This is going to sound really dumb, but I think I was worried that being really athletic was somehow connected to being gay. I think I may have been confused around the age of 13 or 14. I hadn't yet developed, and I was quite fascinated with the bodies of girls who had. I was worried that I might not be normal because I'd 'check out' others girl's bodies in the locker room. Somehow, gym and exercise and all that was kind of confused with that whole issue."

Many women said that physical education was not a required class nor was it available in their schools. Several of those who did have gym as part of their school curriculum did not remember the experience as positive or as influencing them to be active.

> "We could get out of phys. ed. if we were having our period....or *said* we were having our period. On any given gym day, up to half of the girls used that as an excuse. We had a male gym teacher and he'd never challenge us on our 'womanly' excuses....such power we had ! (laughter)."

One subject remembered that gender began to be an issue that influenced activity levels around the time she was in junior high school.

> ".....we had a gym with the girls on one side and the boys on the other, and that is when I became self-conscious. I think a lot of the girls did....we felt like the boys were watching us, and you know, we were at a stage where we were developing physically. The girls who were developed were self-conscious of their breasts, and those of us who hadn't yet developed were self-conscious from...because of our lack of a bust (laughter). And we didn't do anything fun in gym. We did a lot of calisthenics!

Organized sports were largely not available to this cohort of women in their educational settings. Not one of women interviewed cited a childhood experience that positively promoted physical activity in the elementary educational setting.

Four of the women interviewed had found enjoyable activities in the college setting that kept them active. However, with the exception of one respondent who reported taking classes in fencing and bowling, most of the activities were not part of their college curriculum.

As noted previously, most women felt that the 1950's and 1960's offered limited opportunities for girls to become involved in organized sports. In some cases, physical activity was discouraged as being inappropriate for a female.

3. Work Environments

Time spent at work in sedentary jobs was often mentioned as a reason that women do not get enough exercise. Virtually, every woman interviewed thought that the workplace could and should do more to promote physical activity. Almost half (6) of the women suggested having on site exercise equipment available for workers. Five of the respondents suggested that health club memberships be offered as an employee benefit. Several women had specific ideas on how activity could be incorporated into the workplace.

> "I think that (incorporating physical activity into the workplace) would be a great idea. Where I worked at one time, it was a real estate agency, and we had this big empty back room which at one time had been a garage. Employees started bringing in some of their exercising equipment from home. I left before we got it all put together, but I thought that was a great idea."

Another woman came up with the following suggestion:

> "...you know what would be great? Like a pedal device that went under my desk at work. I wonder if it would be possible to rig up something so women could pedal while working on their computer or answering the phone? I guess that would look pretty strange (laughter)...but there are times when I can't get away from my desk and it seems like I would actually feel less stressed if I could walk or get some kind of activity."

Another women said the following:

> "I would love to have (the option) in my workstation, where I could stand and write. If I could have a standing desk, stand to answer the phone or have the computer maybe here (gesturing). I would...because that bothers me...the lack of circulation."

Still another respondent thought that employers could promote activity by sponsoring team sports or events such as walks. There was a general consensus that the employers would benefit from providing workers with physical activity opportunities and would have a happier, healthier and more productive workforce.

Community Factors

Factors that emerged during interviews that could be categorized within the community category included community programs and resources, safety, and weather issues.

1. Community Programs and Resources

Women were asked if they felt opportunities for exercise were available in their communities and neighborhoods. Several mentioned gyms that weren't too far from their homes. A few mentioned informal walking programs that meet every morning at local malls.

> "I have a neighbor who goes to Courtland Mall every morning to walk. Any time you're there in the morning you see all kinds of older people walking the mall."

One woman expressed that she wished that there was some kind of organized sport available for older women.

> "I really wish there was something out there for women like me. I know of a softball league for women in Davison, but the women are a lot younger than I am and better players."

Two woman wished bike paths existed and another thought that it was easier to go walking in older neighborhoods that had sidewalks as opposed to newer subdivisions, where people have to walk in the street.

2. Safety Factors

Every women interviewed said she felt safe walking in her neighborhood. However, many women said they would like to go for a walk during their lunch hour at work, but they did not feel safe walking in the neighborhood around their workplace.

> "The problem is that I'm all out of energy by the time I get home. I'd walk at lunchtime, but I really can't around here. They even tell us not to venture out into the neighborhoods around here. It's not safe."

A few said they would feel safe walking outside their workplace if they walked in groups, but getting a group together took effort that they were reluctant to expend.

3. Weather Factors

Five of the women interviewed mentioned weather as a deterrent to exercising in Michigan. One of the subjects from the active group said it is difficult for her to run outside when there has been a snowfall. One of the women from the somewhat active group mentioned that she has difficulty getting outside when it is wet and cold.

> "I can handle wet and I can handle cold. But I can't handle both."

The three remaining participants who brought up weather were from the sedentary group. Nearly all subjects mentioned the cold Michigan winters.

> "I just got back from Mexico and we were outside walking or biking every day. You forgot how much being cooped up in Michigan during the bad weather impacts you."

Public Policy

During the interview, women were asked if they could think of anything that the government is doing or could be doing to promote physical activity among women between the ages of 40-60. Most women had difficulty thinking of anything. Therefore, the following prompt was used: "If the Surgeon General were in the room with us right now, asking for advice on how to promote activity among women your age, what would you tell him?"

Several women expressed reluctance at the thought of the government being involved in what they considered to be a private behavioral decision. One offered:

> "If the government or the Surgeon General suggested something, people would probably do the opposite."

Another woman recalled a presidential fitness award in school but said it was discouraging because even though she considered herself fairly fit, it required chin-ups. Since she was unable to do a chin-up she did not get the award. She felt that experience discouraged her from exercising for many years. One respondent suggested government could subsidize membership fees to health club facilities, while another said that physical activity needs to be emphasized more in schools.

Two subjects mentioned that physical activity is promoted in Japan and is incorporated into workplaces and in school settings. They felt that our country would benefit by exploring what has been done in Japan and other countries. One subject thought that the government should settle on one recommendation for the amount of exercise that is required for general well being in different age groups, and then do a good job of getting the word out. She felt as though the recommendations change often and confuse people. For the most part, subjects had a difficult time imagining how physical fitness might be promoted on the governmental level.

Discussion

Coming back to the question "What factors influence women between the ages of 40-60 to be physically active?", implications of results will be discussed.

It is known that approximately 31% of American adults are sedentary, and that women tend to be less active than men (Pate et al, 1995). Women also tend to become less active as they get older. Approximately two-thirds of the group studied was found to be sedentary, and although the number of participants is not large enough to be representative of a larger number of women, it is consistent with what would be expected.

Only about 10-15% of American adults can be classified as "Active" (Sallis & Owens, 1999). Two of the thirteen women in this investigation, or 15%, were categorized as "Active", which is also consistent with the literature.

Activity levels are based on the transtheoretical model, which is best used to explain individual levels of readiness. For that reason, the transtheoretical model is best used for the micro levels of the ecological model. Community and Policy levels are not analyzed in terms of association with activity levels.

Discussion of Intrapersonal Factors

Those who were categorized as "Active" perceived their health to better as a group than those who identified as "Sedentary". The "Somewhat Active" group fell in the middle, as might be expected.

Interestingly, having a health condition that currently interfered with a person's ability to be active was not always reflected in the perception of health status or to their level of activity. A woman who reported her current health status as excellent, admitted to a knee problem that is making it increasingly difficult for her to run. Another subject who reported that pain from adhesions made it difficult for her to be active deemed her health as good. Two of the inactive respondents reported current conditions that interfered with their ability to exercise; Meniere's disease and Raynaud's disease. One inactive subject who reported her health status as fair, upon probing was unable to cite any current health problems to explain why she felt her current health was not good. She cited many health problems as a baby and small child, but none that were current or unresolved. Her health history as a small child likely influenced her beliefs regarding the measure of control of she has over her own health, a phenonomen that is consistent with health locus of control theory (Mitchell, 1996).

The group that participated in this project did not vary much in terms of income or race. Higher education was associated with higher levels of activity in the literature (Sallis & Owens, 1999) and results from this pilot study showed the same association. One interesting finding, involved satisfaction with body image. Not one woman who was interviewed was satisfied with their body size or shape. Even the woman who

appeared to be in excellent physical shape and exercised regularly, expressed dissatisfaction with her body. However, the active women were more likely to be satisfied with their body image in regard to weight than the women who were not active.

Having knowledge of the benefits of activity did not transfer to patterns of personal behavior. This finding is consistent with the literature. Several studies have shown that knowledge of the benefits of physical activity is not correlated to activity levels (Sallis & Owen, 1999). Most of the women interviewed were able to list a number of benefits of physical activity, but were unable to translate those benefits to their own life situation. For instance, they might vocalize that "activity is a good stress reliever for women" as a general statement. However, they would mention later that had too much stress in their lives to get around to exercising. The sedentary women were more likely to believe that exercise was boring or a chore, than women who are active or somewhat active.

Personal control has been correlated with higher levels of physical activity in many studies (Wallston & Wallston, 1978; Mitchell, 1996), an that result was demonstrated in this pilot study. The women who were active or somewhat active tended to have confident, "take charge" attitudes. The three women from the sedentary group who were classified as low in personal control, expressed that they had little influence over their lives. They were more likely to feel that circumstances guided their lives in contrast to the women who were judged to be high in personal control. It was also noted that two of the three women who were judged to be low in personal control, had a history of domestic abuse.

Discussion of Interpersonal Factors

Social support from partners, family relationships, friends, co-workers and heath care providers were explored in regard to how they influence physical activity. Many of the women who were interviewed felt family obligations interfered with their efforts to get exercise in the past, but felt less so with grown children.

Marital status was positively linked with activity level, which is consistent with the literature (Sallis et al, 1987). However, assuming marital partners were involved directly with their spouses' activity regimes was unsubstantiated. Those who were 'active' or even 'somewhat active' exercise alone. Social support was mentioned as being important while establishing a program of activity, but became less important after the habit was established.

The high number of women from the 'sedentary' group who expressed that having social support would make exercising more attractive, is an important factor for health educators to consider. Most often, social support from of co-workers was suggested. Since all of the women who were interviewed work full time, the desire for support from co-workers would not apply to a broader sample of non-working women in this age group; however the social support concept is likely still applicable.

Discussion of Institutional or Organizational Factors

The effect of institutionalized gender bias, especially as it relates to educational experiences was brought up repeatedly. Activity history from childhood and young adulthood was the topic that elicited the "richest text" from most respondents. Women

gave detailed histories from their childhoods. The many stories that women revealed in regard to their own personal histories reflected societal norms. Institutionalized sexism made it less likely that little girls had opportunities to participate in organized sports during the 1950's and 1960's. However, while the stories from childhood and young adulthood were colorful and interesting, consistent with the literature (Hofstetter et al., 1990), childhood activity levels did not predict levels of activity in later life.

Many women believed they did not have early opportunities to develop active lifestyles because of gender bias, illustrating a difference from women who are now under the age of forty. Most thought that gender bias has decreased for young girls, but concerns were still voiced.

The issue of incorporating physical activity into the workplace was brought up repeatedly. Many creative ideas were suggested that involved support of co-workers and opportunities to workout on breaks, lunch-hours or as part of the workday.

Having gym membership available as a flexible benefit was suggested often and enthusiastically. When ideas were solicited during the interview for ways to encourage physical activity, an intervention in the work place was most often identified. When speaking about workplace interventions women were very enthusiastic.

Discussion of Community Factors

Research has shown that a shortage of appropriate community facilities and exercise programs may be a barrier to elders' participation in physical activity (Ferrini & Ferreni, 2000). The women who took part in this investigation did not feel that a lack of

facilities or programs was a barrier to them. However all of the women interviewed are working and it is likely that they have transportation to a facility.

All felt that the neighborhood they lived in was safe. But since many thought that exercising during their workday was preferable to exercising before or after work, they were concerned about the safety of the workplace neighborhood. Many were discouraged from walking on their lunch hour because they perceived the neighborhood to be unsafe. The cold weather in Michigan was also mentioned as a deterrent to activity, pointing out the need for more indoor facilities.

Discussion of Public Policy Issues

Most of the women who were interviewed had difficulty imaging how the government might help to encourage activity. While several were familiar with policies in other countries, they didn't express any suggestions for the United States. Rather there was a negative reaction to governmental involvement in activity promotion.

Several women recommended that guidelines for activity be standardized and promoted on a governmental level. The fact that none of the women knew exactly how much and what kind of exercise was optimal for women their age, illustrates a gap in dissemination of such information.

Strengths and Limitations

A strength of the qualitative method used in this investigation is that it allows subjects to speak on a very personal level, and to go into depth on the issues they felt most important to them. For example, subjects were able to discus issues like domestic abuse that would likely have been missed if a quantitative survey had been used.

Doing this type of research requires a set of experiences and knowledge quite different from quantitative research. A tendency to ask excessive questions that were minimally useful during analysis had to be overcome. Allowing subjects sufficient time to consider and discuss opinions and experiences was initially challenging.

Thirteen of the subjects who were interviewed for this project were classified into groups of "Active, Somewhat Active or Sedentary" as a result of self-report. There are some problems inherent with classification based on self-report (Sallis & Owens, 1999). There is an assumption that activity levels are relatively stable over time. Certainly this is not always the case. Self-report also relies heavily on an individual's own interpretation of terms such as "vigorous". Further, this method relies on a person's memory of actual time spent in vigorous activity.

It may be preferable in future studies to simplify categorization of activity to two groups: active and inactive. Having several categories for activity levels along with five ecological categories diluted the results and made both conceptualization and analysis burdensome.

There was overlap in categorization among ecological groups. The framework of this pilot study called for a determination of which ecological group was most appropriate for assignment of variables, which introduces subjectivity. For instance, individual history fits into the intrapersonal category, yet social support comes under interpersonal history. But some personal history stories included interaction with family members and examples of institutionalized gender discrimination, so one sequence of dialogue could fit into three of the ecological group simultaneously. Therefore, assigning

themes to ecological categories was somewhat subjective. One example of this overlap occurred when a woman describing her personal history (intrapersonal) included a story about the influence of her father (interpersonal), that included a sexist view common for that time in history (institutionalized gender bias).

None of the women interviewed felt that their health was poor. Since the entire group of women were full time workers, it stands to reason that this group likely included healthy women. Women who were too sick to be employed could not have been included.

A major limitation of the pilot study involves its generalizability. Since the number of women was small and not representative, selection bias is an issue. The group was composed of white, employed women with homogeneous income levels. Results cannot be generalized to a larger population that would include women from different racial and ethnic groups as well as women who are not employed or are living in poverty.

The determination of efficacy was subjective. Also, self reports for current and past history of activity levels may be subject to recall bias.

Conclusion / Recommendations

The intent of this pilot investigation was exploratory and descriptive. However, the themes generated by the rich text obtained, could easily provide the foundation for a larger quantitative study designed to be generalizable to larger populations. Despite the small number of women included, important insights were identified that should not be overlooked.

Health educators who wish to develop programs to encourage activity among women between the ages of 40 and 60, may want to consider interventions from all levels of the ecological model.

The subjects in his pilot study were quite knowledgeable about the benefits of exercise and seemed to strongly believe that physical activity is "good for people". However, they did not seem to apply that knowledge to their own behavior. A challenge for health educators would be to personalize the message. Women may be more apt to get exercise if they believe not only that "Activity is good for people", but that "Activity is good for me".

Health messages that take into consideration the personal history (generational effect) that women between 40 and 60 experienced is advisable. Many women who grew up in the 1950's and 1960's received messages that activity was "unfeminine" or not important. Those messages have undoubtedly been internalized by some and need to be challenged.

Similarly, women between the ages of forty and sixty may have interpreted the lack of emphasis on physical activity while they were girls to mean that it was not important or necessary for women. The women interviewed were in agreement that more opportunities to be active while growing up would have been desirable and are quick to advocate for younger girls. However, they may benefit from challenging those old messages from childhood and consider how they impact their present level of activity.

Unlike the generation of women that came before them, women between 40-60 were less likely to be exposed to the heavy daily workload that older women experienced

before modern appliances like television and electric appliances were common in households.

The association between history of domestic abuse and level of activity should be studied further. The loss of personal control experienced by women who have been abused may make them feel less capable of being strong and healthy.

A form of social support that could potentially have impact on physical activity behavior involves advice from health care providers. It is well known that advice from a doctor has significant influence on patients. The fact that over half of the women indicated that their physician did not discuss the subject of physical activity offers an opportunity to promote exercise among this age group. A program to educate physicians and other health care professionals, involving counseling patients in regard to physical activity might be indicated. Future studies might also look at an association between the age of the physician and exercise recommendations.

Programs that can be incorporated into the workplace should be strongly considered. Most of the inactive women felt that they would be more active if physical activity could be incorporated into their workday. Community planners should take into account a desire for sidewalks and bike paths that make activity more attractive to residents. Community safety and protection from cold weather are also factors that need to be considered when activity is being promoted.

On the policy level, a standardized recommendation for activity needs to be developed and promoted widely. If an easy to understand recommendation for activity was promoted, middle aged women may feel less confused about the amount and kind of

activity that is recommended for them and more likely in incorporate activity into their lives.

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American College of Sports Medicine. (1990). Recommended quality and quantity of exercise for developing and maintaining cardiorespiratory and muscular fitness in healthy adults. Medicine and Science in Sports and Exercise, 22, 265-274.

This paper is a 1990 position stand by the American College of Sports Medicine that replaces it's 1978 ACSM position paper on recommendations for the quantity and quality of exercise needed to develop an maintain cardiovascular fitness. The recommendations call for exercising 2-5 days per week for 20-60 minutes. Recommendations also include intensity levels that include maximum heart rate percentages and percentage of oxygen update reserves.

Bernard, H.R. (1994). *Research Methods in Anthropology: Qualitative and Quantitative Approaches.* Thousand Oaks, CA: Sage

This book was a useful guide for the understanding of semi-structured interviewing, coding, and interpreting results for qualitative studies. It also offered advice on interviewing, using tape recorders, and methods for probing.

Byrne, A., Byrne, D. (1993). The effect of exercise on depression, anxiety and other mood states: A review. Journal of Psychosomatic Research, 37, 565-574.

This is a meta-analysis of the literature in regard to how exercise has been found to elevate mood status. While supporting that the association of exercise and elevated mood and reduced anxiety, methodological problems are brought to light. It recommends that data be interpreted with caution. Issues like specification of the type of exercise program and specific physiological and psychological result measurement are recommended.

Centers of Disease Control and Prevention. (1994). BRFSS summary prevalence report. Atlanta: U.S.Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, 1-15.

Ettinger, W., Burns, R., Messier, S., Applegate, W., Rejeeski, W., Morgan, T., Shumaker, S., Berry M., O'Toole, M., Monu, J., Craven, T. (1997). A randomized trial comparing aerobic exercise and resistance exercise with a health education program in older adults with knee osteoarthritis. JAMA, Vol. 277, No. 1, 25-31.

This randomized experimental study involved 439 adults who were 60 years of age or older and had radiographic evidence or knee osteoarthritis, pain and disability. Participants were assigned to one of three groups: 1) an aerobic exercise program, 2) resistance exercise program, or 3) health education. Those in both of the exercise groups showed modest improvements in pain and levels.

The recommendation is that exercise be prescribed as part of a treatment for knee osteoarthritis.

Ferrini & Ferrini, *Health in Later Years, 3rd edition.* 2000. Boston: McGraw & Hill.

This book was useful as it dealt with older women specifically. The reasons that older women cite for not exercising guided the questions that were asked in interviews. Some of the reasons sited include: feeling safe, fitting the activity into daily schedules, perceiving a benefit, addressing competing time demands, and feeling that the activity does not cost too much.

Glanz, K., Lewis, F., Rimer, B. (1997) *Health Behavior and Health Education, 2nd edition.* San Francisco, CA: Josey-Bass.

The different models used in health education were outlined in this book. It was useful as a guide for using the transtheoretical (stages of change) model. It also provided a useful definition of self-efficacy in terms of confidence and temptation. Also provided a good overview of ecological approaches to health education.

Green, Lawrence and Kreuter, Marshall W. (1999). *Health Promotion Planning: An ' Educational and Environmental Approach – 3rd edition.* California: Mayfield

This book was also used as a reference for reviewing the various health education theories and models. The succinct description of the ecological model was very helpful.

Hill, R., Storandt, M., Malley, M. (1993). The impact of long-term exercise training on psychological function in older adults. Journal of Gerontology, Vol. 48, No.1, 12-17.

Increases in cardiovascular fitness and self-reported morale were outcomes in this yearlong exercise program for 87 sedentary elderly adults.

Hofstetter, C., Hovell, M, Sallis, J. (1990). Social learning correlates of exercise self-efficacy: early experiences with physical activity. Social Science and Medicine, 31(10), 1169-76.

This study used a mailed survey that was returned by over 2000 male and female adults. Historic experiences with exercise and sports were considered as a predictor of self-efficacy and current exercise behavior. Results showed that early experiences with organized sports of school physical education were not associated with increased exercise in adults.

Hovell, M., Sallis, J., Hofstetter, C., Spry, V., Faucher, P., Caspersen, C. (1989). Identifying correlates of walking for exercise: an epidemiological prerequisite for physical activity promotion. Preventive Medicine, 18(6), 856-66.

This study used the survey information from the study described directly above to attempt to identify correlates of walking for exercise. It found that for the most sedentary groups, self-efficacy, family and friend support, and consumption of a heart health diet were associated with walking for exercise.

King, A. (2001). The coming of age of behavioral research in physical activity. Annals of Behavioral Medicine, Vol. 23(4), 227-228.

Kushi, L., Fee, R., Folsom, A., Mink, P., Anderson, K., Sellers, A. (1997). Physical activity and mortality in postmenopausal women. JAMA, Vol. 277, No. 16, 1287-1292.

This prospective study evaluated the association between physical activity and mortality among over 40,000 postmenopausal women between the ages of 55 and 69. Surveys were used over 7 years of follow-up. It demonstrates an inverse association between all-cause mortality and physical activity. Results strengthen recommendations for post menopausal women to take part in exercise.

Marshall, S., Biddle, S. (2001). The transtheoretical model of behavior change: a meta-analysis of applications to physical activity and exercise. Annuals of Behavioral Medicine, Vol. 23(4), 229-246.

This study summarizes findings from empirical investigations using the transtheoretical model to study physical activity. Overall the use of this model is supported for the study of exercise and physical activity. Behavior change is viewed as dynamic rather bimodal. However studies that go beyond staging or examining cross-sectional differences are needed to discover moderators and mediators of stage transition.

Maxwell, J. (1996). *Qualitative Research Design: An Interactive Approach.* Thousand Oaks CA: Sage

While looking at a sample annotated bibliography, I noticed this book reviewed. Since the description touted this book as "the perfect reference for the beginning reader of qualitative reports", I thought that it would be useful in my quest to understand qualitative methodology. Each chapter gave a clear conceptual overview of the basics of qualitative inquiry. For instance, explaining the research question in terms of: "What do you want to understand?" made for easy reading. This book was also especially useful for describing a sampling method that is recommended for qualitative studies, called purposeful sampling

Mayer-Davis, E., D'Agostino, R., Karter, A., Haffner, S., Rewers. Saad. Bergman, R. (1998). Intensity and amount of physical activity in relation to insulin sensitivity. JAMA, Vol. 279, No. 9, 669-674.

Over 1400 men and women for various cultural and racial backgrounds were recruited for this study. Subjects had glucose tolerance ranging from normal to mild non-insulin dependant diabetes. The objective was to determine whether nonvigorous exercise that is done on a regular basis is associated with improved insulin sensitivity. A positive correlation was found.

McLeroy, K.,Bibeau, D., Steckler, A., Ganz K. (1988). An ecological perspective on health promotion programs. Health Education Quarterly, Vol. 15(4), 351-377.

This article proposes looking beyond individual behavior change as a method of health promotion. An ecological model is proposed that takes social influences into account along with individual factors, as determinants of behavior. Interventions that are directed at changing interpersonal, interpersonal, organizational, community and public policy factors stand to be more successful at addressing factors that support and maintain unhealthy behaviors.

Mitchell, G. (1996). Qualitative study of older women's perceptions of control, health and aging. Health Education Journal, Vol.55 (3), 267-274.

This describes a small-scale study using focus groups to explore beliefs about influences on health and the amount of control that women feel they have over their lives. Women between the ages of 70-90 participated. Results suggest that a strong sense of control becomes increasingly important to maintain good health in later years.

Pate, R., Pratt, M., Blair, S., Haskell, W., Macera, C., Bouchard, C,. Buchner, D., Ettinger, W., Heath, G., King, A., Kriska, A., Leon, A., Marcus, B., Morris, J., Paffenbarger, R., Patrick, K., Pollock, M., Rippe, J., Sallis, J., Wilmore, J. (1995). Physical activity and public health. JAMA, Vol. 273, No.5, 402-407.

This is a public health recommendation that was drafted in order to encourage increased participation in exercise by Americans of all ages. The Centers for Disease Control and Prevention and the American College of Sport Medicine established a committee of five scientists who in turn recruited other experts in physical activity to devise recommendations for physical activity. They concluded that adult Americans should get 30 minutes or more of moderate intensity exercise on most if not all days of the week.

Proschaska, J.,DiClemente, C. (1983). Stages and processes of self-change in smoking.

Journal of Consulting and Clinical Psychology, Vol.5. 390-395.

This model was first introduced in a comparative analysis of change systems that are used in psychotherapy to treat addiction. Five stages of change were described: precontemplation, contemplation, preparation, action and maintenance. This first description of the transtheoretical model is applied to smoking behavior and proposes that individuals go through the stages in a linear fashion.

Rosenstock, I., Strecher, V., Becker, M. (1988). Social learning theory and the health belief model. Health Education Quarterly, Vol. 15 (2). 175-183.

The health belief model, self-efficacy, locus of control and social learning theory are reviewed and critiqued in this article in regard to their predicting and changing behavior. It is proposed that self-efficacy be viewed as an independent variable that should be incorporated into the traditional health belief model.

Sallis,J., Hovell, M., Hofstetter, C., (1992). Predictors of adoption and maintenance of vigorous physical activity in men and women. Preventive Medicine, 21(2), 237-51.

A sub-group of the Stanford Community Health Survey was used in this investigation. Predictors of change in physical activity over time were examined in a randomly selected sample of 1, 411 adults between the ages of 20 and 74. It was found that sedentary men are more likely than their female counterparts to adopt vigorous levels of activity. However, maintenance of moderate levels of activity was associated with the female gender and self-efficacy.

Sallis, J., Haskell,W., Fortmann, S.,Vranizan, K., Taylor, C., Solomon, D. (1986). Predictors of adoption and maintenance of physical activity in a community sample. Preventive Medicine, 15(4), 331-41.

This study looked at predictors of maintenance of vigorous exercise over time. Over 1700 randomly selected men and women's surveys on physical activity were used as a baseline for activity levels. Three activity level were defined The activity level categories; sedentary, intermediate and active, have the same criteria used in this paper. Results showed that predictors are different for men and women differ.

Sallis, J., Owen, N. (1999). Recommended amounts of physical activity. In C. Laughton, E. Carr, S. Robinson, L. Gray, D. Santoyo (Eds.), *Physical Activity & Behavioral Medicine* (pp. 56-70,93-106,135-153). New York: Sage.

This recently published book was a valuable resource. Early in my literature review, I found the name coming up repeatedly in relation to research into

physical activity. This book consolidates the literature on physical activity and interprets it from an interdisciplinary behavioral perspective.

Major sections of the book include 1) Physical Activity and Health, 2) Defining and Measuring Physical Activity, and 3) Understanding and Influencing Physical Activity. Conclusions and Future Directions are also discussed, focusing on key research issues, translating research into practice and understanding and influencing the societal barriers to physical activity.

Shumway-Cook, Gruber, A. Baldwin, M., Laio, S. (997). The effect of multidimensional exercises on balance, mobility, and fall risk in community-dwelling older adults. Physical Therapy, 77, 46-57.

One hundred and five subjects aged 65 years or older and had a history of at least 2 falls in the previous 6 months were recruited through their doctors. They were randomized into one of three groups; (1) control, (2) partially adherent exercise group or (3) fully adherent exercise group. Mobility and balance was initially measured. Those measures were repeated after 8-12 weeks. Those in either of the exercise groups did better on mobility and balance measure at the end of the study than did the controls.

Strauss, A., Corbin, N. (1999). *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory: Second Edition.* Thousand Oaks, CA: Sage.

This book was a tremendously helpful guide to Qualitative Research. It Provides a rich conceptual overview of this research method and stress the importance of building rather than testing theory. It guides the reader in translating data into useful categories that can then be interpreted. Methods for coding were explained extensively, yet in terms a beginner could easily understand.

Thune, I., Brenn, T., Lund, E,. Gaard, M. (1997). Physical activity and the risk of breast cancer. The New England Journal of Medicine Vol. 336, No. 18, 1269-1275.

This is a longitudinal study involved a mailed survey to over 25,000 women, aged 35-49 from three different countries. After 13.7 years, 351 cases of invasive breast cancer were identified. Initial and subsequent levels of activity over the years were studied and it was found that increased levels of activity were associated with lower risk for the development of breast cancer.

Wallston, B.S., Wallston, K.A. (1978). Locus of control and health: a review of literature. Health Education Monographs, Spring, 107-117.

Review of the locus of control construct that originated from social learning theory. Reviews research efforts that aim to understand health behavior in terms of expectancies bases on people's belief that their health is or is not determined by their own behavior.

Appendix A
Interview Questions

Numbers following questions are associated with the 5 levels of the ecological model. Although responses often fell into several categories, the number noted after each question is an attempt to illustrate questions that were asked to illicit consideration from each of the five levels of the ecological model.
1=intrapersonal, 2=interpersonal 3= institutional/organizational 4=community 5=public policy

1. Would you say your overall health is excellent, very good, good, fair of poor? (1)
2. Do you currently have any physical conditions or health problems that make it difficult for you to be physical activity? (1)
3. Which best describes your level of physical activity over the last four weeks: (1)
   a. No sessions of vigorous activity
   b. One or two 30 minute sessions of vigorous activity weekly
   c. Three or more sessions of vigorous activity weekly
4. Were you physically active as a child, around the age of 10 or younger? (1,3,4)
5. Was your family active? (2)
6. Did your family encourage you to be active? (2)
7. Did your activity level change when you entered your teenaged years? (1)
8. Did the onset of menstruation impact you r level of activity in any way? (1)
9. Did you have an opportunity to participate in organized sports while you were growing up? (3,4)
10. How about physical activities as a young adult? Tell me about your activity level while you were in your twenties and thirties. (1,2,3)
11. Are you satisfied with the amount of physical activity you participate in currently? (1)
12. (If no) What do you think is the most important reason you don't get enough activity?
13. Are you satisfied with you body shape and size? (1)

14. Do you know what the current recommended levels for physical activity for healthy women your age are? (10)

15. I have a list of benefits and barriers to activities that was compiled by the American Heart Association after interviewing many people. I'm going to first list some of the reasons other people have mentioned when they talk about why they aren't as active as they feel they should be. Let me know if any of these factors apply to you, or if it's not something that you've experienced.

    a. Some people say that they feel like they don't know how to exercise. Do you feel that way?

    b. Too stressed to exercise?

    c. Not enough time to exercise?

    d. How about not enough money? Do you feel that if you had more money it would make exercising easier?

    e. Do you dislike working up a sweat?

    f. Are you uncomfortable about being seen in exercise clothing or a swimsuit?

    g. Don't enjoy exercising or feel it's boring?

    h. Too tired to exercise?

    i. Have no one to exercise with?

    j. Experience pain while exercising?

    e. Is there anything I've missed that you'd like to add to the list?

16. Now I'll list some of the benefits of being active. Tell me if you agree.

    a. Helps to maintain a healthy weight or lose weight?

    b. Feeling better physically when you are active?

c. Feeling better mentally when you are active?

d. Having more energy?

e. Sleeping better?

f. Setting a good example for others?

g. Being able to eat more food without gaining extra weight.

17. What things can you think of that make it easier for you to exercise at this particular time in your life?

18. What things can you think of that make it difficult for you to exercise?

19. Do you feel like being female influences the amount of kind of physical activity you receive? (3)

20. Does your doctor ever ask you about your level of activity or give advice in regard to diet or exercise? (2,)

21. Do you feel safe going out to walk in your neighborhood? (4)

22. What opportunities are available for exercising in your community? (4)

23. Can you think of anything that the government is doing or could be doing to promote physical activity? (5)

24. If the Surgeon General were in the room with us right now, asking for advice on how to promote activity among women your age, what would you tell him? (5)

25. Is there anything in regard to physical activity and women your age that you feel we've missed or you'd like to add?

26. What is your marital status? (2)

27. What is your household income less than $50,000 per year? (1)

28. What is the highest level of education you have completed? (1)