Qualitative Descriptors of Exercise in Older Women

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The self-regulation of exercise maintenance model was used to study the episode-specific interpretations of exercise of older women immediately after an exercise episode. Seventeen women, mean age 69.7 ± 4.9 years, were recruited to represent a variety of exercise patterns. A semistructured episode-specific interview was administered after an exercise episode. The questions asked related to physiological/somatic and cognitive/emotional sensations associated with exercise and the social/environmental context of the exercise experience. Data analysis revealed five themes—somatic sensations, affirmations, connectedness, explanations, and reflections—each of which contained distinct categories. The proposed self-regulation of exercise maintenance model was clarified to better represent the data grounded in the women’s descriptions. The women’s qualitative descriptors will be used to develop a quantitative instrument to measure older women’s interpretations of exercise. Future research should involve testing the self-regulation of exercise maintenance model and examining interventions that affect episode-specific interpretations and thereby exercise maintenance.

Key Words: self-regulation, exercise maintenance, episode-specific interpretations

Evidence of the many health benefits of regular physical exercise continues to accumulate. So convincing is this evidence that the U.S. Department of Health and Human Services (1992) listed physical activity and fitness first on its list of objectives for the year 2000. While initiation of exercise is problematic for many, maintenance of regular exercise poses an even greater challenge. In fact, only about 10% of adults in the U.S. participate in vigorous activities during their leisure time; another one third are active at a lower intensity or frequency. Fully 31% of the population do not exercise at all (Stephens & Casperson, 1994).

Of special importance is the prevalence of a sedentary lifestyle among the growing number of older individuals. Forty-three percent of individuals 65 years of age and older engage in no leisure-time physical activity (U.S. Department of Health and Human Services, 1992). This is especially important since older individuals represented 11% of the population in 1980 and are projected to increase to about 22% by 2030 (Spencer, 1989). Since older individuals incur three times the health care costs of younger individuals (Philipp & Biordi, 1990), interventions that

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promote or maintain functional capacity and prevent or lessen the impact of chronic disease may reduce health care expenditures. In addition, since women outnumber men in this age group (about 70% are women), interventions tailored to women are especially needed.

Few studies have examined factors associated with exercise maintenance in older individuals, especially older women. Further, many researchers have not used conceptual frameworks to guide studies designed to increase the understanding of exercise maintenance. Those who have based their research on theory have used social learning theory and self-efficacy (Desharnais, Bouillon, & Godin, 1986; Kaplan, Atkins, & Reinsch, 1984), health belief models (Oldridge & Streiner, 1990), learning theory (Lees & Dygdon, 1988), and decision theory (Kendzierski & Lamastro, 1988). After reviewing several models, Herbert and Teague (1988/89) found none of them to adequately explain exercise maintenance. In addition, none of these models incorporate episode-specific variables in an attempt to understand exercise maintenance. Most of the existing models include variables that are external to the exercise experience. More specifically, theories like social cognitive theory or the theory of planned behavior are directed toward beliefs about benefits or outcomes (delayed variables) and abilities. These variables may be affected by exercise episodes, but they are distal to the sensations experienced during exercise. Thus, a self-regulation model that includes interpretations of sensations during exercise may provide a more comprehensive explanation of exercise and is more relevant to exercise maintenance (Sluijs & Knibbe, 1991) and to intervention design.

Prior to this study, a self-regulation of exercise maintenance model (see Figure 1) was adapted from Leventhal’s self-regulation theory (Leventhal, 1983; Leventhal, Neren, & Steel, 1983; Leventhal, Neren, & Straus, 1982). Within this adapted framework (Schneider, 1995), the individual interprets cognitive/emotional and physiological/somatic information related to exercise. Interpretation is defined as the awareness of sensations, thoughts, and feelings associated with exercise, and the meaning assigned to exercise (Leventhal, Neren, & Straus, 1982; Neren & Leventhal, 1983; Schneider, 1995). Through a feedback loop, each exercise episode is thought to add new information to the interpretations of existing information. The aggregate of information is interpreted and may alter goals and drive new or existing behaviors. This process is continuous as additional information is added.

Figure 1. Self-regulation of exercise maintenance.
Interpretation of exercise in the self-regulation of exercise maintenance model occurs at two levels: (a) an episode-specific, concrete level and (b) a general, conceptual level. At the episode-specific level, individuals interpret the exercise experience during and after each episode of exercise. For example, perspiration, stiffness, soreness, and shortness of breath reflect physiological/somatic information at the episode-specific level. Cognitive/emotional sensations include release of tension and reduction of stress. At the episode-specific level, goals are short-term and drive behavior within each exercise episode. For example, an individual may decide that today 30 min will be spent on exercising instead of the usual 20 min. Episode-specific interpretation may change fairly quickly and may alter immediate exercise behavior (Schneider, 1995).

General interpretations involve long-term, abstract information accumulated from all exercise episodes. For example, physiological information at the general level includes information about improved functional independence and knowledge of potential improvements in physiological measures such as blood pressure, weight, bone density, and blood cholesterol levels. Cognitive/emotional sensations include feeling less depressed or having an improved self-concept. Goals at the general level are long-term, for example, to exercise three times per week to stay in shape. General interpretations incorporate the most recent episodes but are more stable than episode-specific interpretations (Schneider, 1995).

Because episode-specific interpretations tend to be more concrete and immediate, they can be changed more readily than general interpretations, thus making them a prime target for interventions (Schneider, 1995). For example, health professionals can work with exercisers during an episode of exercise to build positive interpretations of the experience and promote exercise maintenance.

Self-regulation operates within a social/environmental context and can be described in two ways (Schneider, 1995). First, the social/environmental context surrounds the performance of the exercise episode and influences episode-specific interpretation, such as relationships with other exercisers, the weather, and the scenery. Second, behavior is influenced through input from the larger social environment (Nerenz & Leventhal, 1983), such as health care providers, media, friends, family, and cultural influences.

To test the self-regulation of exercise maintenance model, instruments are needed to measure each aspect of the model. The Exercise Benefits/Barriers Scale (EBBS) can be used to measure general interpretations of exercise (Sechrist, Walker, & Pender, 1987). The EBBS contains nine subscales: five benefit subscales (Life Enhancement, Physical Performance, Psychological Outlook, Social Interaction, and Preventive Health) and four barrier subscales (Exercise Milieu, Time Expenditure, Physical Exertion, and Family Discouragement). EBBS items measure broad concepts of exercise and can be used to represent general interpretations of exercise. To my knowledge, no instrument exists to measure episode-specific interpretations of exercise. Thus, in preparation for future instrument development, this qualitative study was conducted to elicit qualitative descriptors of episode-specific interpretations of exercise in older women. Therefore, the purpose of this study was to answer the question, What are the episode-specific interpretations of exercise of older women immediately after an exercise episode?
Method

SAMPLE

Seventeen women, mean age 69.7 ± 4.9 years, who participated in a wide variety of exercise patterns were recruited from senior centers. I expected episode-specific interpretations to be unstable for new exercisers and more stable as exercisers become long-term maintainers. Thus, recruiting older women with a variety of exercise patterns was expected to provide diverse episode-specific interpretations and ensure inclusion of maintainers as well as beginners.

Eleven (64.7%) women participated in low-impact aerobics, 5 (29.4%) women walked, and 1 (5.9%) did stretching exercises. Fourteen (82.4%) women were white and 3 (17.6%) were black. Exercise behavior ranged from 20 to 75 min in duration, one to seven times per week. Women were asked to indicate how hard they usually exercised using Borg’s (1970, 1973) ratings of perceived exertion (RPE) scale. The women reported a range from 9 to 15 (possible range 6–20). This provided an estimate of intensity. The women had been exercising from 1 month to 30 years. Eight (47.1%) women were married, 7 (41.2%) were widowed, and 3 (11.8%) were separated or divorced. One (5.9%) woman had attended some high school, 5 (29.4%) had completed high school, 8 (47.1%) had attended some college, and 3 (17.6%) had completed college. Average monthly income was $1,940 ($457 to $5,000). Because announcements were made to groups and sign-up sheets were posted, the number of women who refused to participate was impossible to track.

Adequacy of sample size in qualitative research is a matter of judgment and depends on the purpose of the qualitative product (Sandelowski, 1995). The qualitative product of this study was a set of categories made up of descriptors, or terms, from women with a variety of exercise patterns. Sampling was terminated when a variety of exercise patterns were evident and no new descriptors emerged, referred to as redundancy (Lincoln & Guba, 1985). Thus, a sample size of 17 women was determined appropriate for the purposes of this study.

INTERVIEW

All 17 women were interviewed about their exercise behaviors and their episode-specific interpretations of exercise as soon after an actual exercise episode as possible (usually within 4 hr). The episode-specific interview consisted of two sections: close-ended questions regarding exercise patterns and open-ended questions exploring participants’ interpretations of exercise. Included in this latter section were questions relating to physiological/somatic and cognitive/emotional symptoms and sensations and the social/environmental context. These questions were followed by one that explored the understanding of the symptoms and sensations. For example, if a participant responded that she felt relaxed when she exercised, she was asked, “Why do you think that is?” Women were asked about symptoms and sensations of the immediate exercise behavior as well as symptoms and sensations when exercise episodes were missed.

PROCEDURE

The study was announced at exercise sessions and sign-up sheets were posted at senior centers to recruit participants. For women who volunteered to participate,
appointments were made to meet with each woman after an exercise session to tap
the experience of that episode. Written informed consents were obtained from those
who volunteered to participate. During the interview, participants were asked about
their exercise behavior to ensure variation in exercise patterns. Next, participants
were asked about the symptoms and sensations they experienced physically and
mentally during their recent exercise episode. They were also asked about the
environment, their goals, and their thoughts during exercise. Finally, demographic
data were collected. The interview took 1 to 1-1/2 hr. Responses were audiotape
recorded, and notes were taken during the interview. Recordings were transcribed
for analysis, and transcriptions were entered into The Ethnograph (Seidel, Kjolseth,
& Seymour, 1988), a computer program for qualitative data management.

ANALYSIS

To answer the research question, responses to the interview questions were
analyzed using methods described by Miles and Huberman (1984, 1994). During
the initial analysis, word segments were coded and clustered into categories, which
were then grouped into themes. To establish credibility, peer debriefing was done
several times during data collection and analysis. The purpose of peer debriefing is
to discuss working hypotheses and additional steps in the methodological design,
in order to clear the investigator’s mind and essentially keep the investigator
“honest” (Lincoln & Guba, 1985). Interrater reliability was performed by having
three other qualitative researchers each analyze and categorize a randomly selected
25% of the data. Thus, each rater had a different set of data representing in total 75%
of the data examined for interrater reliability. Initial reliabilities, calculated using
Cohen’s kappa (Brennan & Hays, 1992; Cohen, 1960; Kvalseth, 1989), were .77,
.86, and .87. Disagreements were discussed and reliabilities were corrected to .96,
.95, and .98, respectively.

Results

Five themes emerged from the data: somatic sensations, affirmations, connected-
ness, explanations, and reflections.

SOMATIC SENSATIONS

Somatic sensations described physical feelings and sensations experienced by the
women during exercise. The women reported having musculoskeletal, coronary,
respiratory, and temperature-related feelings. Several categories were contained in
this theme: stretch and strain, heart pumping, out of breath, and warm and sweaty.

The stretch and strain category referred to discussion of musculoskeletal
feelings or sensations. Some women deliberately pointed out that they didn’t have
any aches or pains. Nonetheless, the majority of women were aware of musculo-
skeletal sensations during exercise. Some comments were as follows:

“I could feel my muscles straining.”
“Well, it kind of pulled, you know, and kind of felt a little tug there when I
reached down.”
"If I start out with an ache or pain or something in some place, usually it will go away. It's never gotten any worse or anything."

A few women reported being aware of their heart pumping. Two women stated,

"I had the blood feeling like it was pumping in the feet and legs which I hadn’t had before since I was a little kid."

"Oh, my heart beats hard."

Several women described feeling out of breath or being aware of their breathing. For example, three women reported,

"I got kind of winded, and they say if you get too winded, just go at your own pace."

"Sometimes, I’m kind of out of breath when we’ve got going real fast."

"While you’re exercising, you’re breathing more."

The final category under the somatic sensations theme was called “warm and sweaty.” The women were aware of various bodily temperature changes during their exercise. Most of their comments related to being warmer; however, a few women also mentioned cooling down. This category included all references to temperature changes and was named “warm and sweaty” because even cooling down implied a period of being warmer. Examples of comments falling into this category include the following:

"Oh yeah, I get pretty warm, but I’ve always done that. I notice some of the ladies down there can exercise and never get any redness in the face. I redden up right away."

"And I didn’t get too sweaty or hot during exercises so I still felt good when I came home."

"I had cooled down. I had gone down. See, when you take this exercise, at first you’re just warming up, and then you really do the exercise. And then you go down."

AFFIRMATIONS

The women also described perceptions that were not physical sensations. This theme was referred to as affirmations. Within this theme four categories emerged: accomplishment, improved outlook, comradery, and support from others. Accomplishment and improved outlook included perceptions that originated within the women themselves. Accomplishment referred to feelings of success as well as feelings of being unsuccessful with exercise. Inherent in these feelings were self-expectations or an acceptable standard or goal that was unique to each woman.

"I don’t expect the impossible for me, but if I’m going to do it I want to give it my best shot."

"There are two of us with a walker out there, but I’m the only one that goes all the way around."

"Oh, just a feeling of, sort of accomplishment, at my age that I’m able to do all this."

Women often described an improved outlook or change in attitude when they exercised or missed exercise. Examples that described women’s attitudes or outlook when they exercised included the following:
“It was really an uplifting experience for me to go.”
“And it just picked up my whole . . . mental attitude really.”

Following are examples of women’s comments of outlook or attitude when asked if they noticed a difference if they don’t exercise:

“Oh yes, I get sluggish, and I get cranky and irritable and cross and I don’t want to do the housework.”
“Kind of disinterested in most things. Not completely disinterested, but not as much. I don’t think about certain things like I do otherwise.”

Some of the women perceived comradery and support from others because of their exercise. The majority of women described support they received during the exercise experience as a fellowship or comradery. Although 1 woman did find walking with someone to be an intrusion, interactions with others in the exercise setting seemed important to most of the women. Examples of comradery include,

“It’s much easier to exercise if you have someone to exercise with.”
“It’s the ‘comraderyship,’ is that what I want to say? You know with getting back with the ladies that have been in here.”
“Yes, we have a lot of fun doing it. And we tease one another if one gets goofed up or something you know.”

Several women perceived little or no support from people outside the exercise experience yet continued to exercise, in some cases for many years. Other women described support (or lack of support) from others who were not involved in exercise, for example the people with whom they lived. Examples of support from others include,

“He [husband] probably thinks it’s doing me a lot of good and he might be a little envious of my energy. And he won’t [exercise].”
“Well, this morning I got up and started to get my clothes on, he [husband] says, ‘Are you going to romper room today?’”
“Oh, my husband says to me, ‘Get up and get going because it’s time for you to work out, cause you was kind of draggy yesterday, so I want you to work out so you can get with it.’”

CONNECTEDNESS

Many women described feelings that were not exclusively physical sensations or mental perceptions but involved aspects of both. This theme was called connectedness because it signified a connectedness between the mind and body. Categories under this theme included energetic, alert, and relaxed (referring to both mental and physical feelings). Nearly every woman described having more energy in many different ways.

“I just feel so exhilarated. I feel just motivated and just super duper.”
“It energizes you for the rest of the day.”
“Let’s see, it’s a good, it’s a pumped-up feeling. It is when I’m walking.”

When asked how they feel if they don’t exercise, two described,

“Just icky. I don’t want to do anything. I don’t have the energy to do anything.”
“Just sluggish, I don’t, everything just feels tired. I don’t feel peppy.”
The majority of women described feeling more alert or sharper, or having a clearer head. Three of the women said,

“I think I’m sharper, there’s no doubt that my mental process is a little sharper.”

“Because I don’t seem like I’m not awake enough or something. My brain isn’t, my head isn’t awake like it should be if I don’t exercise.”

“It just seems like I’m a little bit sharper, not a whole lot, not a genius of course.”

Women also reported feeling relaxed, referring to a release of tension:

“You just feel relieved and relaxed.”

“I’m relaxed; I’m enjoying myself.”

EXPLANATIONS

To more fully understand how women interpreted their exercise, I asked them why they thought these perceptual changes occurred. This theme, labeled explanations, refers to the women’s thoughts about their perceptions during exercise. Generally, the women described three reasons for their perceptual changes: blood circulation, oxygen, and bodily movements.

Blood circulation was frequently referred to as the cause of the women’s perceptual experiences. This category included thoughts about circulation or increased blood flow as an explanation for what the women experienced with exercise. Included in this category were references about hormonal circulation. Examples of comments in this category include,

“I think that I’m, in getting that blood flowing, physically, I think that’s what happens in the first place (and I think that is probably what branches off to enjoy the atmosphere).”

“Well, I lay it to the fact that my blood’s circulating better.”

“Cause of blood circulation. Not only does the blood circulation help that, it helps my brain.”

The category titled oxygen refers to thoughts about increased respiration as an explanation for perceptual experiences with exercise. Two women described oxygen this way:

“I think I get my heartbeat up and I get more oxygen. While you’re exercising you’re breathing more.”

“And for me, along with the respiratory, and cardiac benefits, it’s also a mental thing.”

The bodily movements category refers to women’s thinking about moving parts of their body as an explanation for what they experienced with exercise. Three women described,

“Oh, I think a lot of it is a, keeping the flexibility in the joints moving and that kind of thing.”

“Well, I just think that because I have moved those body parts, that now they can be a little more flexible and relax. Does that make sense?”

“It’s [soreness] because I’m not used to it. I wasn’t using my muscles.”
REFLECTIONS

The final theme, reflections, included various things the women thought about while they exercised. Categories under this theme include **surroundings, routine, music, memories, things to do, and problem solving.**

Surroundings referred to thoughts about what was going on around the women during their exercise. A woman who walked in a mall reported,

> "Who’s coming toward me? Who’s that pretty suit over there in the window? How much does it cost? I can’t get in there to find out."

Two women who walked in neighborhoods reported,

> "The scene changes. . . . The cars in the yard change. The cars on the street change and people work on their houses. They work in their yards and the scene changes."
> "I heard the birds singing, which I enjoy so much."

Routine includes thoughts about the women’s steps and movements within the exercise itself. Three women described,

> "I totally concentrate on the routine, on the exercise."
> "I’m new to this program and I concentrated on learning the steps and paying attention."
> "We concentrate really on the exercise tape. And the aim is to keep your feet going down at the same time."

The music category included women’s thoughts about the music that accompanied their exercise. For example,

> "Of course I enjoy the music. It’s my era of music and I like to hear all the old songs."
> "The type of music, of course, I’m from the golden oldies and I like the more relaxed, what is the word, I don’t care for rock and roll and all that."
> "I sing along with almost every damn country [song]."

Several women described the memories they thought about while they exercised. The memories were frequently triggered by the music that they exercised to.

> "The music is soothing and relaxing and it puts me back in a time that was a fun time for me. I was a teenager . . ."
> "Some of the songs makes me think back to forty years ago."

At times, the women planned their day and listed all the things they had to do that day. This category was named “things to do.”

> "Well, here again, was probably my plan for today, cause I thought if it don’t rain, I’ll go get my coat first. So, if it rains, I’ll go to the grocery store."
> "Well, I got to get this, and I’ll have the children for supper, and this and that, you know, and what I have to do when I got home and things like that."

Problem solving was the category that included references to thinking about problems. Two women said,

> "I think while I was actually doing it, it allowed me, I think, to sift and sort, and put any problems, anything stressful in its proper perspective, and then I’m ready to handle it."
"But I mean I don’t think about worrisome things, I just float along just like a different world."

**Discussion**

Examination of the data suggested that women tended to exercise to achieve positive effects, physical or mental, and/or to avoid negative effects. In almost all cases, the women reported positive interpretations of their exercise. This is probably because the women were self-selected and likely more positive about exercise. Further study should determine if those with positive interpretations have different exercise behaviors than those with negative interpretations.

Two categories that emerged were consistent with previous research. Similar to the category of comradery in this study, social interaction was found to be important by other investigators (Carron, Widmeyer, & Brawley, 1988; Spink & Carron, 1992; Wankel, Yardley, & Graham, 1985). Likewise, accomplishment, which is closely related to self-efficacy, was also important to the women of this study, consistent with the findings of Sallis and colleagues (1986, 1989). However, none of the previous theory-based studies of women reported sensations and interpretations of the actual exercise experience, an important aspect of understanding exercise maintenance. Episode-specific interpretations allow examination of women’s understanding of their exercise experience. This is different from theories such as social cognitive theory, theory of reasoned action, or theory of planned behavior, where beliefs rather than the sensations of the exercise experience are the focus. Episode-specific interpretations in the self-regulation of exercise maintenance model are grounded in the descriptions of the women themselves. This allows a fuller understanding of exercise for older women.

In this study, theory was used both centrally and peripherally (Sandelowski, 1993). Initially, theory was used centrally by collecting data to represent the episode-specific dimensions of the theory. During analysis, peripheral use of the theory allowed the data, women’s descriptors, to be the central focus. Consequently, categories and themes emerged that differed from the theoretical dimensions of the self-regulation of exercise maintenance model.

The four categories under the theme of somatic sensations fit within the physiological/somatic dimension of the model. The other themes do not fit exclusively into the cognitive/emotional dimension or the social/environmental context. For example, the theme affirmations has many cognitive/emotional qualities but includes affirmation from others that is derived from interactions within the social context. Likewise, connectedness has physical as well as mental components to each category. Explanations represent the cognitive understanding of the perceptual experiences. Reflections describe cognitions during the exercise experience. In fact, one could argue that somatic sensations are the cognitions of the physical sensations and that cognitions actually run throughout the women’s descriptions. It would seem that the self-regulation of exercise maintenance model would be more representative of these women’s descriptors if the somatic and emotional dimensions and the social/environmental context were subsumed under cognitions. Then to best understand interpretations, researchers need to measure all aspects of cognitions. Therefore, the findings of this study led to a clearer understanding of the episode-specific dimensions than originally conceptualized in the self-regulation of exercise maintenance model (see Figure 2).
The results of this preliminary study suggest that women have concrete experiences during each exercise episode as well as a conceptual understanding of these concrete experiences. In other words, episode-specific interpretations cannot be limited to concrete information alone but must include the conceptual understanding of the concrete information. This conceptual understanding at the episode-specific level differs from the conceptual understanding at the general level, because at the general level interpretations are distal to the exercise episode.

General interpretations also may stem from concrete experiences of which individuals have a conceptual understanding. However, general interpretations differ from episode-specific interpretations in that general interpretations refer to interpretations outside the exercise experience, whereas episode-specific interpretations refer to interpretations within the exercise experience. Both levels of interpretation involve a conceptual understanding of concrete experiences. What differs is the proximity to the exercise experience itself.

One limitation of this study was that participants were recruited to represent a variety of exercise patterns based on their self-report of exercise behavior. No objective indices of exercise behavior were assessed. In addition, this exercise behavior represented current behavior disregarding changes over time. However, because this study was a descriptive study to examine the range of qualitative descriptors, self-report of current status was considered adequate for these purposes.

Another limitation was the small sample size. However, because the purpose of this study was to obtain a set of descriptor categories from women with a variety of exercise patterns, sampling was terminated when a variety of exercise patterns were evident and descriptive information was redundant. It was expected that other older women would be able to relate to the descriptors of the 17 women in this study.

And finally, this study included only women who had an exercise experience. However, episode-specific interpretations of exercise vary from episode to episode, allowing a wide range of experiences from the women. Thus, the group of women who participated in this study likely represent a wide range of exercise experiences.

Future research should be conducted using a quantitative instrument developed from these qualitative data. Then, multiple regression techniques can be used to examine the unique contribution of episode-specific interpretations to exercise behavior. Interpretation profiles of women can be examined to predict rates of maintenance and dropout. Latent variable modeling can be used to test the
self-regulation of exercise maintenance model. In addition, future research can include longitudinal studies to examine women’s interpretations of exercise over time. And finally, studies are needed to determine how exercise maintenance is affected by interventions such as making episode-specific interpretations more positive during an episode of exercise.

**References**


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