Motivational Factors and Physician Advice for Physical Activity in Older Urban Adults

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This study aimed to ascertain by means of a new scale older adults’ motives for engaging in physical activity, in a probability and representative sample of an older urban population. The sample size was 630 older adults, ranging from 65 to 94 years in age, randomly selected using multistage sampling. The participants completed a 17-item questionnaire, as well as answering questions on demographic variables, type of demand for physical activity, and physician’s recommendation. A principal-component analysis was performed. The relationships among the four factors (physical health, social relationships, competence, and physician’s advice) show a clearly motivational structure. Significant relationships have also been found between physician’s recommendation and type of demand. The findings suggest that programs promoting physical activity in older adults should have different characteristics from those aimed at general adult populations.

Key Words: exercise, aging, factor analysis, motivational scale

The National Blueprint for Increasing Physical Activity notes that “despite a wealth of evidence about the benefits of physical activity for midlife and older adults, there has been little success in convincing Americans aged 50 and over to adopt physically active lifestyles” (Sheppard, Senior, Park, Mockenhaupt, & Chodzko-Zajko, 2003, p. 287). In addition to identifying barriers, the Blueprint proposes a number of concrete strategies that could be employed to overcome the barriers to physical activity in society at large. With regard to research strategies, it appears that there is a need to understand behavioral factors related to physical activity participation and adherence, an aspect pinpointed in Research Strategy # 3: “Conduct research to better understand what motivates individuals to participate and remain involved” (Sheppard et al., 2003, p. 291). In the same way, medical-systems strategies simply recognize the importance of a physician’s recommendation to older adults to engage in physical activity.
Prior research has shown that there are multiple motives for older adults, including their physicians’ advice, for engaging in physical activity (Cohen-Mansfield, Marx, & Guralnik, 2003; Graupera, Martínez del Castillo, & Martin, 2003; Rhodes et al., 1999; Searle & Iso-Ahola, 1988; Takamine, 2001; Van Norman, 1998). The studies reviewed, however, show a great deal of diversification in the methodology used, the types of sampling (almost always nonprobability), the types of samples selected (age, gender, health status, physical activity levels, nationality), and their conclusions. For this reason, the main purpose of this study was to investigate, in a representative and probability sample of an entire population of older urban residents, the possible motive structure for engaging in physical activity (including physicians’ advice) and the possible relationship between a physician’s recommendation and the engagement by the older adult in physical activity or the desire to do so. The article begins by presenting a review of the literature on older adults: first, studies that focus on the motives for engaging in physical activity, and second, those that concentrate on the relationship of the physician’s recommendation to engage in physical activity and type of demand of physical activity.

Searle and Iso-Ahola (1988) studied the determinants of leisure behavior among retired adults. Their sample consisted of 340 older residents (63 years and older, with no breakdown by gender) of Manitoba, Canada, selected using a nonprobability, quota method. The data were collected via a mail questionnaire. The authors concluded that health is the principal determinant of participation in leisure activities and highlighted the importance of programs and services that cover the different leisure and health needs of older people. According to the authors, however, results must always be interpreted with an understanding of the limits of the sampling procedures. Takamine (2001), referring to data obtained from a study of the Japanese population, points out that

It seems that health-related factors are the main motives for participation in sport. In Japan, 55% of sport participants, including walkers, give “for health and physical fitness” as a reason for such participation, and that proportion rises with the age of the respondents. (p. 381)

The author does not provide information on the methodology, the type of sampling, or sample characteristics. Neither is information available on the rest of the possible motives (e.g., improve technique, improve attractiveness, get out of the house, enjoyment, get to know other people) or the possible interrelationship among them.

Frederick and Ryan (1993) studied the relationships between motivation for physical activity, level of participation indices, and psychological outcomes of activity. Their sample consisted of 376 adults who engaged in physical activity (241 women and 134 men, 1 participant gender unknown, with a mean age of 39 years, range 18–75) who were drawn from the population of all the employees of a university and an associated university hospital in the United States. Participants were recruited by a survey sent to 2,000 people whose names were randomly selected from an employee mailing directory. Questionnaires were distributed and returned in a one-time mailing. The rate of return was 20.8%. To measure the participation motivation in the domain of physical activity, a 23-item questionnaire was used. Participants were asked to indicate on a 5-point Likert scale the degree to which each motive was personally true for them with respect to their primary physical activity. The questionnaire was subjected to a factor analysis, oblique
(promax) rotation, to confirm the factor structure found in the pilot studies. The same three factors emerged from this analysis: a body-related factor (eigenvalue = 7.17) composed of 10 items relating to desires to improve physical appearance and fitness; a competence factor (eigenvalue = 5.62) composed of 7 items relating to skill development, competition, and challenge; and an interest/enjoyment factor (eigenvalue = 1.87) composed of 6 items related to fun and enjoyment. The amount of variance explained by each factor was 31% for the body-related factor, 24% for the competence factor, and 8% for the interest/enjoyment factor. Interest/enjoyment was significantly correlated with competence motivation, as expected, but was unrelated to body-related motivation. Competence motivation was also uncorrelated with body-related motivation. Together with the limitations of the type of sampling, of the sample (all physically active, mean age 39 years, and probably a medium- or high-level social status), and the administration of the questionnaires by mail, it should also be mentioned that the questionnaire did not include items later suggested in the literature on motives and physical activity of older adults, for example, socializing with other people, delaying aging, or a physician’s recommendation to engage in physical activity.

Van Norman (1998), starting from a review of the literature, suggested that there are many reasons for an older adult to contemplate joining an exercise program (without indicating the possible hierarchy of importance, or the possible interrelationships, and without providing empirical evidence from his own research or that of other authors): a physician’s advice; a noticeable loss of physical abilities and a desire to regain full function; improving one’s aerobic condition, strength in one’s legs or upper body, balance and coordination to prevent falls, or flexibility for decreased pain and increased mobility; and improving overall health, appearance, or social life.

In the research of Cohen-Mansfield et al. (2003) on the motivators and barriers to exercise, the participants included 324 older community-dwelling adults age 74–85 years residing in a previously determined geographic area of the State of Washington. Of these, 58% were women, and 96.3% had at least a high school education. The sampling was multistage and nonprobability (for a more detailed description of the recruitment procedures see Marx, Cohen-Mansfield, and Guralnik, 2003). Participants were asked to complete a health questionnaire. Motivators to exercise were coded from the responses to the open-ended question, What would motivate you to exercise more than you do now? Cohen-Mansfield et al. identified the following motivators for exercise: improved health or feeling better physically (32.2%), someone to exercise with (14%), the program was well organized (12.4%), I have more time (9.1%), reasons unknown (6.6%), good weather (5%), and other (24%; includes convenience, motivated to lose weight, treat fear, doctor’s recommendation, encouragement/motivation, being at a resort, swimming, shopping, and a free program).

Graupera et al. (2003), in a pilot study of the present project, investigated motives for engaging in physical activity. The sample consisted of 235 older women who participated in community physical activity programs in three municipalities in the Madrid region of Spain. The sampling of the survey was nonprobability, and the sample was not representative of older women in the Madrid region. The participants had a mean age of 69.3 years (range 50–90). Questionnaires were completed by means of personal face-to-face interview in the sport facilities in
which the programs were conducted. To measure participants’ motivation in the domain of physical activity, a 17-item motivational scale was used. Participants were asked to indicate, on the scale, the degree to which each motive was personally true for them with respect to their physical activity. All the motives on the scale were considered fairly or very important, except “I like to compete,” which is the only motive that obtained a significantly lower than average score on the ordinal scale (“fairly important”).

Rhodes et al. (1999), in their review of the literature on the factors associated with exercise adherence among older adults, suggest that one of the social factors that influenced this adherence is perceived physician support, even though this support was not frequently present. For example, in Canada, Stephens and Craig (1990) found in a 1988 study that only 56% of those over 65 years of age were being encouraged to exercise by their doctors. Rhodes et al. suggest that physician support for geriatric exercise requires further study, because this factor might be an important intervention strategy for exercise adoption and maintenance. According to Shephard (2000), however, in the past, many physicians have adopted a very cautious approach to exercise screening, and there remains a need to increase their understanding of the importance of physical activity to health and quality of life: “Nevertheless, it is becoming increasingly clear that the more serious error is to discourage rather than to encourage a patient’s desire to exercise” (p. 210). Hardcastle and Taylor (2001) carried out qualitative research on a sample of 15 older women (50–80 years of age) in the United Kingdom who were participating in a program of physical exercise recommended by their general practitioner (GP). The unstructured interviews were conducted privately in the cafeteria during a visit to the leisure center for an exercise session. Hardcastle and Taylor concluded that in terms of implications for practice, the idea that GPs could take a greater role in initiating the referral process has long been recognized: “The status and reverence attached to GPs by the older population is such that doctors and health professionals have opportunities to promote physical activity to a large proportion of the population” (p. 325). Nied and Franklin (2002) suggest that it is imperative that physicians take the lead in motivating their older sedentary patients to adopt an active lifestyle.

Mills et al. (2001) evaluated enrollment bias in the recruitment process and examined the usefulness of a two-phased recruitment strategy in enrolling representative proportions of eligible individuals in a physical-activity-promotion program for older adults in northern California. Eligibility criteria included, among other aspects, being underactive, having no extreme functional impairment, and having no serious medical conditions that could limit participation in light to moderate physical activity. Of the adults 65 years and older who were members of one of two Medicare HMOs, 1,381 were randomly sampled to received the initial telephone contact, and 519 were eligible for study (mean age 75 years, 64% women), out of which 173 enrolled in the program of physical activity. Of the 519 eligible individuals, it was found that 53.2% had received medical advice recommending exercise. Among those who finally enrolled in the exercise program, 65.3% had received medical advice recommending exercise, whereas only 47% of the respondents who did not enroll had received such advice (no statistically significant relationships were observed between medical advice and enrollment in the program). Furthermore, using multiple logistic-regression analysis, Mills
et al. found the following as predictors of enrollment: interest in health, previous health-class attendance, and having had a physician recommend exercise. In regard to enrollment bias,

comparing age of those who continued through each step of recruitment with those who did not revealed that at almost every step, those who continued were significantly younger than those who did not continue. For five of the steps, there were few gender differences between those who continued through each step of recruitment and those who did not continue. (p. 403)

Balde, Figueras, Hawking, and Miller (2003) studied in an unidentified city in the United States whether physicians counsel their older patients to engage in exercise and whether the patients receiving such advice exercise more than those who do not. Their sample included senior citizens (age 65 years and older) with low incomes, living in public housing managed by the city, all engaging in physical activity. Balde et al. classified physical activity into three categories: sitting physical activities (sewing, playing musical instrument, knitting), light physical activities, and moderate to heavy physical activities. A paper-and-pencil questionnaire was distributed among 400 randomly selected residents, and 146 completed and returned questionnaires were finally analyzed. The age of the 146 participants ranged from 65 to 99 years (with a mean age of 77.9), and 74% were women. In analyzing physician counseling, only 61.6% reported receiving advice about physical activity from their physicians. With regard to the possible association between physician counseling and physical activity, physician’s advice was not a factor in engaging in sitting or light physical activities. There was a significant association, however, between receiving a physician’s advice and engaging in moderate to heavy physical activities. Older adults who received such advice performed more moderate to heavy physical activities per week than those who did not.

The review of the literature on older adults’ motives for carrying out physical activity and the influence of physicians’ advice still yields inconsistent results. No motivational scale of physical activity for older adults has been found. There are deficiencies in the methodologies employed: The questionnaires tend to be self-administered and sent by mail, and the types of sampling are nonprobability, most being convenience sampling (Balde et al., 2003; Graupera et al., 2003; Hardcastle & Taylor, 2001; Searle & Iso-Ahola, 1988; Takamine, 2001); that is, they are not statistically representative of the general populations of older adults, so the conclusions lack external validity. Moreover, none of the studies on older adults’ motives for engaging in physical activity have tackled the relationship with the three types of demand for physical activity in which older adults in a geographic area can be classified. The term types of demand for physical activity (Martínez del Castillo, Rodríguez, Jiménez-Beatty, & Graupera, 2005) is a variable that classifies individuals as a function of engaging in physical activities at present and their interest in engaging in some physical activity at present, three types of demand being suggested for a determined territorial system:

- Established demand (ED): individuals who engage in some physical activity
- Latent demand (LD): individuals who do not engage in physical activity but would like to do at least one activity and are interested in becoming active
• Absence of demand (AD): individuals who do not engage in physical activity and furthermore are not interested in doing so

Starting from the limitations observed in the literature, the objectives of the present study are as follows:

• To construct a motivational scale for older adults’ practice of physical activity and to analyze the psychometric qualities of reliability and construct validity.
• To analyze the relationships among the motivational factors.
• To test the validity of the scale to differentiate among the groups of demand in older adults (ED and LD).
• To establish the motivational structure for engaging in physical activity in older adults in the Madrid region of Spain, with relative preference for different motivational factors.
• To ascertain the prevalence of physicians’ advice to engage in physical activity in older adults in the Madrid region and its relationship with the three groups of demand for physical activity (ED, LD, and AD).

Methods

Sample and Procedures

The total population from which the study sample was drawn was the 815,337 residents 65 years or older (59.8% women, 40.2% men) of the Madrid region (Blanes, 2004). With regard to the sample, the following options were adopted and complied with in the design: The size of the sample from a population considered infinite from a technical point of view was \( N = 630 \) individuals, with a confidence interval of 95.5%, a sampling error of ±4%, and, assuming in the population variance the most unfavorable case of \( p \) being equal to 50%, \( q = 50\% \). The distribution of the sample was proportional to the gender and number of older adults residing in each of three major areas of the region: Madrid capital, 72%; metropolitan area, 18%; periphery—nonmetropolitan municipalities, 10%.

The sampling method used was multistage probability (Bryman, 2004; Fink, 1995), because, as stated by Fowler, “When there is no adequate list of the individuals in a population and no way to get at the population directly, multistage sampling provides a useful approach” (1988, p. 27).

In Stage 1, the sampling units were the region’s municipalities (the districts in the municipal capital, Madrid); that is, in this stage there was a random selection of which municipalities of the region and which districts of the municipal capital of the region interviews with older adults would be carried out in using the questionnaire. Interviews were also programmed in proportion to the number of older adults residing in each of these municipalities and districts.

In Stage 2, the sampling units were the boroughs; that is, in this stage there was a random selection of which boroughs in each municipality or district, selected in the previous stage, interviews with the older residents were to be carried out in using the questionnaire. Interviews were also programmed in proportion to the number of older adults residing in each of these boroughs.
In Stage 3, the sampling units were the 63 streets at the beginning of each interviewer’s route (there were 63 routes) in each of the boroughs selected in the previous stage. These streets were also randomly selected. The route to be taken by each interviewer included 10 interviews; that is, the paper-and-pencil instrument was to be administered to 10 older adults, 4 men and 6 women (selection was made proportional to the distribution by gender of the population of older adults residing in the Madrid region).

In Stage 4, the sampling units were the older adults \( N = 630 \) finally selected to be interviewed in their homes (only 1 older adult was interviewed in each home; the only selection criterion used was that the person be 65 years or over, in addition to the criterion of being a man or a woman, depending on the interviews pending in each route) using the research questionnaire. This selection was also random and was made by the interviewer on each route, applying the random-route (Miquel, Bigné, Cuenca, Miquel, & Lévy, 1997; Rodríguez, 2000) and random-procedure (Fowler, 1988, p. 33) criteria provided by the research director. The fieldwork was carried out during February 2005. The mode of administering the paper-and-pencil instrument was a personal, structured, face-to-face interview (Bryman, 2004; Fowler); that is, the interviewers administered the questionnaire by means of personal face-to-face interviews in each selected older adult’s home.

**Instrument**

A new motivational scale that had been designed by the authors for the practice of physical activities in older adults was used. This scale consists of 17 items originally written in Spanish, presented in Table 1 in their English translation. Each of the items is ranked on a 3-point scale, 1 being *not important*, 2 being *fairly important*, and 3 being *extremely important*. The list of items was taken from the motives applicable to older adults included in Frederick and Ryan’s (1993) motivational scale for physical activity in adults and the lists of motives found in our review of the literature on older adults’ motivation for the practice of physical activity (Cohen-Mansfield et al., 2003; Rhodes et al., 1999; Van Norman, 1998). We administered a preliminary version of the motivational scale in a pilot study to a very homogeneous sample of 235 older women (age range 50–90 years) enrolled in physical activity programs in municipal facilities in the Madrid region (Graupera et al., 2003). This pilot study showed that all the items were understood by the participants and that they answered them easily. Given that the scale is new and was being administered for the first time to a general sample of older adults, information on the reliability and construct validity of the scale is presented later in the article.

In addition, a brief questionnaire was administered, which included questions about the main sociodemographic variables (age, gender, and social class), the type of demand for physical activity (ED, LD and AD), and whether the respondent had received a recommendation to engage in physical activity from his or her physician.

**Data Analysis**

A principal-component analysis was conducted to estimate the construct validity of the motivational scale. Several tests were conducted to study compliance of the basic assumptions of the principal-component analysis. The first was Bartlett’s
test of sphericity. In addition, Kaiser’s measure of sampling adequacy was calculated to verify that the correlations between pairs of variables were not a result of elevated partial correlations. Values for the measure of sampling adequacy greater than .60 indicate that the matrix is adequate to obtain a good factorial analysis (Tabachnick & Fidell, 1996). The Kaiser–Meyer–Olkin index was also calculated as the global value of sampling adequacy of the matrix. Most of the measure of sampling adequacy and the Kaiser–Meyer–Olkin index itself was greater than .80, giving a result that can be qualified as good (Hair, Anderson, Tatham, & Black, 1998). The criterion of retaining the factors that have an eigenvalue of more than 1 was used to calculate the number of factors that should be extracted. An oblique rotation was performed with the extracted factors using the promax method, with the intention of obtaining a theoretically significant factorial structure. For a sample size of more than 200 participants, as in this case, loadings greater than .40 are considered significant, even following the restrictive criteria of Hair et al. Additive scales were elaborated corresponding to the factors extracted, and their reliability was evaluated with alpha coefficients. A repeated-measures MANOVA was conducted to estimate the relative importance of the additive scales obtained. In the case of significant differences between the scales, the corresponding post hoc contrasts were carried out applying Bonferroni’s correction criteria. The Phi correlation coefficient was used to analyze the relationship between physicians’ recommendations and the type of demand, as an estimator of the effect size. The software package used for these analyses was SPSS for Windows 13.0.

Results

Sample Characteristics

With respect to age, 62.4% of the participants were between 65 and 74, and 37.6% were over 75 ($M = 73.40$, range 65–94). With regard to gender, 40% were men. Most (90%) participants lived in urban systems (Madrid capital or the large municipalities in the metropolitan area). Only a small proportion (10%) lived in the bordering municipalities (the greater part of which are undergoing a process of residential and cultural urbanization). With respect to social class, 9.4% declared themselves to be upper class or upper middle-class, 47.2% middle-class, and 43.4% lower middle or lower class. All the sociodemographic data from the sample coincide with the tendencies observed in the demographic studies carried out on the older population in the Madrid region (Blanes, 2004). With regard to the type of demand for physical activity, 16.3% had ED, 25.2% had LD, and 58.4% had AD.

Reliability and Construct Validity of the Scale of Older Adults’ Motives for Engaging in Physical Activity

Following are the results of the principal-component analysis performed to establish the construct validity of the scale of motives. First are the analyses of compliance of the critical assumptions of the principal-component analysis. Bartlett’s test of sphericity of the matrix of correlations yielded the value $\chi^2 = 793.62$ ($df = 136$, $p < .001$), thus rejecting the sphericity hypothesis. Kaiser’s measures of sampling adequacy calculated for each item varied from .68 to .91, with a Kaiser–Meyer–Olkin
index of the scale of .85. Therefore, the matrix of correlations is adequate to obtain a good factorial analysis.

Four factors were obtained with an eigenvalue of more than 1, which accounts for 64.95% of the total variance. This percentage is satisfactory (Hair et al., 1998). A promax oblique rotation was performed with the four extracted factors. The factor-pattern matrix obtained represents the unique contribution of each variable to the factor (Table 1). In the matrix we can see that all the loadings of each item in their corresponding factor are greater than .40 (the lowest loading being .44). In addition, most of the items have loadings higher than .50. Thus, it can be concluded that all the variables are adequately represented in one of the extracted factors. The presence of variables having a certain degree of loading in a second factor is perfectly logical in an oblique rotation and enriches the conceptual analysis. The main factors obtained were given the following designations for the reasons presented in the Discussion section: competence, social relationships, physical health, and physician’s advice.

An additive scale was constructed from each of the four factors. The scales were calculated with the means of the direct scores of the items included in each factor. A summary of the descriptive statistics of the resulting scales is presented in Table 2. The reliability of the scales is calculated by the procedure of internal consistency

### Table 1  Factor-Pattern Matrix (Oblique Rotation)

<table>
<thead>
<tr>
<th>Item</th>
<th>Competence</th>
<th>Social relation</th>
<th>Physical health</th>
<th>Physician advice</th>
</tr>
</thead>
<tbody>
<tr>
<td>I like to compete</td>
<td>.780</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improve my technique</td>
<td>.770</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feel appreciated</td>
<td>.697</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintain or improve attractiveness</td>
<td>.542</td>
<td></td>
<td>.365</td>
<td>.342</td>
</tr>
<tr>
<td>Feel useful</td>
<td>.537</td>
<td></td>
<td></td>
<td>.342</td>
</tr>
<tr>
<td>Learn the activity</td>
<td>.516</td>
<td></td>
<td>.329</td>
<td></td>
</tr>
<tr>
<td>Forget about problems</td>
<td>.439</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Get out of the house</td>
<td>.845</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enjoyment</td>
<td>.722</td>
<td></td>
<td></td>
<td>- .308</td>
</tr>
<tr>
<td>Occupy free time</td>
<td>.677</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Get to know other people</td>
<td>.627</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintain or improve health</td>
<td></td>
<td></td>
<td>.829</td>
<td></td>
</tr>
<tr>
<td>Be fit</td>
<td></td>
<td></td>
<td></td>
<td>.819</td>
</tr>
<tr>
<td>Feel good</td>
<td>.304</td>
<td>.638</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delay aging</td>
<td></td>
<td></td>
<td>.423</td>
<td>.410</td>
</tr>
<tr>
<td>Medical advice</td>
<td></td>
<td></td>
<td></td>
<td>.807</td>
</tr>
</tbody>
</table>
(Cronbach’s alpha coefficient). The coefficients obtained varied between .77 and .70 (Table 2). The internal consistency of the factor of physician’s advice was not calculated because it has just one item.

**Relationships Among the Motivational Factors**

In most cases quite high and statistically significant correlations were obtained. The motivational factor of competence was considerably related both to social relationships ($\Phi = .43, p < .001$) and to physical health ($\Phi = .42, p < .001$). The social-relations factor, in addition to being related to competence, was related to physical health ($\Phi = .35, p < .001$). The physician’s-advice factor was only appreciably related to physical health ($\Phi = .32, p < .001$).

**Differences Among the Groups of Types of Demand**

We conducted $t$ tests for the difference of the means between the two groups of types of demand (ED and LD) in each of the four motivational factors. As Table 3 shows, significant differences were found only in the physician’s-advice factor; the effect is also moderate although higher in the ED group than in the LD group (mean difference $= .26, p = .014$).

**Table 2  Descriptive Statistics of the Motivational Scales and Alpha Coefficients**

<table>
<thead>
<tr>
<th></th>
<th>$n$</th>
<th>$M$</th>
<th>$SD$</th>
<th>Number of items</th>
<th>Alpha coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competence</td>
<td>258</td>
<td>1.66</td>
<td>0.50</td>
<td>7</td>
<td>.77</td>
</tr>
<tr>
<td>Physical health</td>
<td>260</td>
<td>2.41</td>
<td>0.45</td>
<td>5</td>
<td>.73</td>
</tr>
<tr>
<td>Social relations</td>
<td>260</td>
<td>2.26</td>
<td>0.53</td>
<td>4</td>
<td>.70</td>
</tr>
<tr>
<td>Physician advice</td>
<td>248</td>
<td>1.68</td>
<td>0.82</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Table 3  Results of $t$ Tests for the Difference of the Means Between the Groups of Types of Demand**

<table>
<thead>
<tr>
<th></th>
<th>$t$</th>
<th>df</th>
<th>$p$</th>
<th>Mean difference</th>
<th>Standard error</th>
<th>95% Confidence Interval for Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competence</td>
<td>-0.93</td>
<td>241.57</td>
<td>.356</td>
<td>-.06</td>
<td>.061</td>
<td>-.177 to .064</td>
</tr>
<tr>
<td>Physical health</td>
<td>1.35</td>
<td>240.41</td>
<td>.178</td>
<td>.07</td>
<td>.055</td>
<td>-.034 to .183</td>
</tr>
<tr>
<td>Social relations</td>
<td>0.08</td>
<td>231.85</td>
<td>.938</td>
<td>.01</td>
<td>.066</td>
<td>-.125 to .136</td>
</tr>
<tr>
<td>Physician advice</td>
<td>2.48</td>
<td>246.00</td>
<td>.014</td>
<td>.26</td>
<td>.105</td>
<td>.054 to .468</td>
</tr>
</tbody>
</table>
Relative Preference of the Motivational Factors in Older Adults in the Madrid Region

The results of the MANOVA including the four motivational factors as repeated measurements indicated that there were significant differences among the different motivational scales, $F(3) = 239.37$, $p < .001$. The size of the effect of these differences is very considerable: The partial $\eta^2$ value was .75. The differences among the motivational factors, applying Bonferroni’s criteria, were produced in the following way (Figure 1). The scale of physical health was significantly more valued by the older adults than all the others ($M = 2.41$). The scale of social relationships is the second most valued ($M = 2.26$), being significantly greater than both the scale of competence ($M = 1.66$) and the variable physician’s advice ($M = 1.68$). There were no significant differences between the later two.

Physician’s Recommendation of Physical Activity and Type of Demand

Regarding the question asked to the total sample ($N = 630$) as to whether a physician had recommended physical activity, the number of older adults (46.2%) who answered that their physician had not recommended exercise is surprising. We should probably add that the percentage of older adults who indicated they did not know or who did not answer was 12.8%. Only 41% of all the older adults in the sample had received medical advice to exercise.

Figure 1 — Comparison of the means of the motivational factors, with 95% confidence intervals.
The relationship between having or not having received a physician’s recommendation for physical activity and the type of demand was moderate but significant ($\Phi = .23, p < .001$). Most (64%) of the participants in the ED group had received a physician’s recommendation for physical activity, but this percentage was lower (57%) in the LD group and much lower (37%) in the AD group.

Discussion

We found that the older adults’ motives for engaging in physical activity can be structured into principle factors. This is important, first, because it allows us to establish the reliability of the scales and the validity of the construct; second, because intra- and intergroup difference can be calculated in a more concise and statistically efficient way than if each motive were used as an individual variable; and third, because it promotes a clearer and more structured comparison of the results of the different studies already published on motivation and physical activity in older adults.

Construct Validity of the Motivational Scale and Denomination and Interpretation of the Factors

The first of the factors includes variables related to the internal psychological benefits associated with the practice of physical activity, such as improvement of physical or motor competence. These variables, within the scheme of achievement-goal theory (Nichols, 1984), can be included in the two motivational approaches that have been proposed stemming from the theory of task involvement and ego involvement (Duda, 1993). Motives such as “learn the activity” or “improve my technique,” are clear descriptions of task-involvement, whereas “I like to compete,” “feel useful,” “improving attractiveness,” or “feel appreciated” are typical indicators of ego involvement, that is, involving performance and self-esteem by means of social comparison. Therefore, the factor is designated as competence in the sense of task involvement and ego involvement. This designation has been used by Frederick and Ryan (1993).

The second factor grouped variables that referred to the social benefits that the older adults associate with the practice of physical activity: “get to know other people,” “get out of the house,” “occupy free time,” and “enjoyment.” This factor is designated social relationships. Van Norman (1998) uses a similar designation: social life.

The third factor groups variables that refer very clearly to the benefits of engaging in physical activity for the health of the older person. Understanding health here in a restrictive sense, oriented only towards physical or corporal health (social benefits or for self-esteem are also benefits for the biopsychosocial health of the person). Thus this factor, which groups “be fit,” “delay aging,” “feel good,” and “improve health,” is designated physical health. This designation is similar to the ones used by diverse authors, for example health and physical fitness (Takamine, 2001), body-related factor (Frederick & Ryan, 1993), and improving overall health (Van Norman, 1998). As a motivator for exercise, Cohen-Mansfield et al. (2003) use the term improved health or feeling better physically.

Finally, a fourth factor saturated by mainly one variable was obtained. This variable is medical advice. The impulse toward physical activity does not proceed...
from the internal perception of the benefits of such activity but from an external force: “because the doctor told me to.” Because there is only one very strongly loaded variable in the factor, it is designated physician’s advice. This designation is used by other authors, including Van Norman (1998). Mills et al. (2001) use the expression physician’s recommendation of exercise as a predictor of enrollment in exercise programs. As a motivator for exercise, Cohen-Mansfield et al. (2003) use the term doctor’s recommendation. It is interesting that this extrinsic factor of motivation is positively associated with other motivational variables that seek an external benefit from the activity that is being practiced, such as “delay aging” and “feel useful.” Moreover, to complete this logic, it is negatively related with the motivational variable that is clearly the most intrinsic, “enjoyment” in the practice of physical activity.

The extracted factors are statistically consistent and conceptually coherent and refer to recognized existing motivational dimensions in the scientific literature on older adults’ motivation for practicing physical activity.

Reliability of the Motivational Factors

Alpha coefficients higher than .70 can be considered acceptable and adequate for using the scales to compare groups (DeVellis, 2003; Nunnally & Bernstein, 1994; Prat & Doval, 2003). Having a theoretical model we can count on to show satisfactory construct validity and a sufficiently reliable instrument could contribute to improving research on older adults’ motivation to engage in physical activity. The motivational structure could be based on an empirically contrasted model and not on merely deductive classifications by individual authors. If it were applied to different populations with different sociocultural characteristics, meta-analyses could be performed with ease.

Relationships Among the Motivational Factors

Fairly high correlation coefficients were found among the first three main motivational factors obtained. This type of analysis has not been performed by other authors using samples of older adults. Working with a sample of physically active adults, Frederick and Ryan (1993) obtained a set of relationships that was appreciably different among similar factors. In fact, they only found an appreciable relationship among the factors that they call competence and interest/enjoyment, which incorporate items similar to social relationships in the present study. The factor they call body-related motivation, which incorporates items similar to the physical-health factor in this study, is not related to the rest of the factors. Therefore, if the motivational scale obtained by Frederick and Ryan in their sample is used as a referent motivational structure for the practice of physical activity in adult populations, it seems clear that the motives related to health are independent of the rest. In the random sample representing the population of older adults in this study, however, the motivational structure is clearly different, because the whole set of factors shows a coherent relational framework. Furthermore, the factor physician’s advice, which had not previously been included in a factorial analysis, is in turn related with the factor of physical health. As a result, programs promoting physical activity for older adults should have different features than those applied to general adult populations.
Differences Among the Groups According to Type of Demand

Between the groups of ED and LD, there is only one moderate difference in the physician’s-advice factor. In spite of this difference not being outstanding, it is of considerable interest. It should be taken into account that the rest of the motivational factors are equivalent in these two groups of demand (ED and LD). Thus, although the effect is slight, the only differential motive between older adults belonging to the ED and the LD groups is medical advice. It would be appropriate to carry out further factorial research that, on one hand, includes the physician’s-advice factor in the motivational structure of older adults, given that it has not been included in previously published studies, and, on the other, that includes in the sample older adults from the LD group, which had never previously been considered by other authors.

Older Adults’ Relative Preference for Different Motivational Factors

The physical-health and social-relationships factors are the most important and have a mean value much higher than the central value of the scale. The factors competence and physician’s advice reach very similar values. Both are well above the lowest value on the scale, which would indicate a lack of motivational weight, although they are also significantly lower than the central value of the scale despite an approximation to it. They can be considered motives of moderate importance in the motivational structure toward physical activity in older adults.

The literature does not include studies that would permit a ranking of the relative importance of the different motivational factors in older adults, but one particularly interesting study did rank the motivators for exercise according to their percentage of inclusion in responses to an open-ended question directed at physically active older adults (Cohen-Mansfield et al., 2003). In that study the two most cited motivators were feeling better/improved health and someone to exercise with, which are similar to the two motivational factors preferred by the older adults in the Madrid region. This study did not include the competence factor, and with regard to doctor’s recommendation it is included in the category of another motivator, with no mention of its relative frequency or importance.

Physician’s Recommendation and Type of Demand

Only 41% of respondents received an express recommendation from their physicians to engage in physical activity. This percentage is lower than that observed in populations of older adults of other nationalities, which are over 50%: Rhodes et al. (1999) with a sample of Canadians, Mills et al. (2001) with a sample from northern California, and Balde et al. (2003) with urban samples from the United States. The health authorities from the Madrid region should take action like those established in the medical-systems strategies of the National Blueprint (Sheppard et al., 2003) to promote physical activity in older adults.

Although physicians’ recommendations to engage in physical activity are uncommon in the population of older adults in the Madrid region, it is advisable to observe the differences in the prevalence of this type of medical advice in the different types of demand groups. In this case a significant relationship has been
found between a higher percentage of physician’s recommendations and the tendency to approach the ED group. Participants in the ED group received physicians’ advice to engage in physical activity in 7% more cases than the LD group and in 27% more cases than the AD group. This tendency for more physically active older adults to more often be advised to practice physical activity than the less active has already been observed in nonprobability and nonrepresentative samples of a whole population of older adults (Balde et al., 2003; Mills et al., 2001). It is the first time, however, that this significant relationship has been found in a study with a representative and probability sample of an entire population of older adults (including all the possible situations with regard to demand for physical activity: ED, LD, and AD).

Finally, certain limitations of the present study should be mentioned. It was carried out with a representative sample of a population of older adults with very precise sociocultural characteristics (e.g., urban-metropolitan, European-Mediterranean), so the results should not automatically be generalized to other types of populations. It is suggested that in further research in other representative and probability samples of older adults, possible motivational differences be studied: according to gender and social class, between urban older residents and rural urban residents, and among older adults from other cultures, ethnic groups, and nationalities. The type of research applied is merely descriptive and limits itself to comparing preexisting sample groups. It would also be interesting to test with experimental designs the relationship between physician’s advice and active lifestyle.

In the present study, using factorial analysis in a probabilistic random sample, we developed a theoretical model of older adults’ motivation for engaging in physical activity. This model is conceptually consistent, can be easily evaluated, and has four principle factors: physical health, social relationships, competence, and physician’s advice.

References

Graupera, J.L., Martínez del Castillo, J., & Martín, B. (2003). Factores motivacionales, actitudes y hábitos de práctica de actividad física en las mujeres mayores [Motivational


