

## Physical Activity and Psychological Well-Being in Older Women

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Physical activity clearly has benefits for the health and well-being of women and men of all ages, and activity may well be particularly beneficial for older individuals. Physical gains and health benefits of activity are well documented, and physical activity is identified as a health promotion priority area by the U.S. Dept. of Health and Human Services.<sup>1</sup>

Older individuals typically experience declines in physical functioning and increasing incidence of chronic health problems such as cardiovascular disease and osteoporosis. Although some declines with age are inevitable, considerable evidence indicates that physically active older individuals maintain healthy functioning longer than do sedentary peers.<sup>2,3</sup> For example, in summarizing research on activity and health among the elderly, Nieman<sup>3</sup> concluded that elderly active people experience less loss of cardiorespiratory function with age; elderly respond to training and improve cardiorespiratory function; and regular physical activity reduces susceptibility to osteoporosis, fractures, and various chronic diseases.

Although the growing research on activity and aging emphasizes physical health, activity may be even more important for the psychological well-being of older adults. Quality of life is a key concern in current health and medical research, but the research is limited with respect to older individuals, particularly women. McAuley and Rudolph,<sup>4</sup> in a review of research on activity, aging, and well-being, concluded that existing research overwhelmingly supports a positive association between physical activity and well-being. However, that research is limited in several ways. We lack clear, standard measures of both well-being and physical activity, particularly measures that are relevant for older adults. Most studies use specific measures of anxiety or depression rather than more encompassing measures that include positive affect. Assessing physical activity in a typical older adult population is problematic. Recent reports and guidelines advocate lifestyle activity and suggest that typical daily activities (eg, walking, gardening) offer health benefits,<sup>5</sup> but most activity measures have been developed for younger people and emphasize aerobic exercise activities.

We focused on the relationship between physical activity and psychological well-being with typical, healthy older women in this study. We used multiple psychological measures including self-efficacy, a general well-being inventory, and ratings of health and well-being. We assessed physical activity with a recently developed physical activity inventory<sup>6</sup> designed for older adults. We focused on healthy older women and included a relatively large sample distributed over a wide age range (65-95 years old) to reflect the typical population of older adults. We expected a positive relationship between activity levels and psychological well-being. We also expected some declines with age and, thus, examined the combined influence of age and activity on psychological well-being to determine the relative contributions of each.

### METHOD

#### *Participants*

Women ( $n = 130$ ) were recruited from senior residences, activity programs, and announcements in local newspapers and senior newsletters in the Triad region of North Carolina. The sample included women living

independently and those living in senior residential housing; some who were largely sedentary and some who were very active.

### *Measures*

Participants completed surveys including demographic characteristics and psychological well-being measures, individually or in small groups, at residences, activity centers, or on campus. Investigators were present to answer questions and, if necessary, to read and record responses. The activity measure was administered in interview format during a subsequent individual laboratory session that included a medical screening and motor tasks completed for other purposes.

### *Demographic and Activity Information*

Demographic information included age, sex, race/ ethnicity, marital status, education, employment, living arrangements, and wearing glasses/contacts. Participants also completed items on exercise and stair-climbing activity, and they reported any falls within the last 12 months.

### *Activity Efficacy*

For all efficacy items, participants indicated how confident they were that they could perform a task, using a percentage scale ranging from 0% (not at all confident) to 100% (absolutely certain). Our overall efficacy measure included three items each for stair climbing (climb two stairs, one flight, four flights), stair descent (go down two stairs, one flight, four flights), walking (walk 1 block, 1 mile, 2 miles), and participating in moderate or vigorous physical activity (1, 3, 5 days per week). Percentages were averaged over the three levels of each activity and then totaled for the activity efficacy score.

### *Health and Well-Being Ratings*

To assess perceived health and well-being (HNB), we adopted a set of ratings that King et al.<sup>7</sup> used with middle-aged adults in an exercise program. Specifically, respondents rated themselves, in comparison to others of similar sex and age, on their health, physical fitness, sense of confidence and well-being, ability to concentrate, satisfaction with body shape and appearance, general mood, and energy level, using a 5-point (1 = poor, 5 = excellent) scale.

### *General Well-Being Schedule*

Participants also completed the General Well-Being Schedule (GWB),<sup>8</sup> an 18- item self-report questionnaire developed by Dupuy for the U.S. Health and Nutrition Examination Survey. McDowell and Newell<sup>8</sup> report reliability and validity information and recommend the GWB as an indicator of subjective well-being. The GWB includes both positive and negative items, all with a time frame of "during the last month." The first 14 items use a 6-point response scale, and the final four items are 0-10 rating scales. The GWB includes six subscales: anxiety, depression, positive well-being, self-control, vitality, and general health, which can be totaled for an overall GWB score. Total scores can range from 0 to 110, with higher scores indicating more positive well-being.

### *Activity Measure*

DiPietro et al.<sup>6</sup> developed and provided reliability and validity evidence for the Yale Physical Activity Survey (YPAS) for older adults. The YPAS is an interviewer-administered questionnaire with two sections. In the first section, respondents indicate the time (hours per week) spent in specific work, exercise, and recreational activities. In the second section, respondents indicate the frequency and duration of their participation in five categories of activities (ie, vigorous activity, leisurely walking, moving, standing, and sitting). The first section yields a total time score and an intensity score calculated by multiplying each activity time by an intensity code. The second section yields indices (calculated from the frequency and duration scores and an intensity weighting) for each of the five activity categories, which are then totaled for an overall index.

## RESULTS

Descriptive information, including demographic characteristics and general information on activity and well-being, is presented first. Separate correlations between activity measures and psychological well-being, as well as between age and psychological well-being, follow. Finally, stepwise multiple regression analyses are presented, with activity and age used as predictors of the psychological measures.

### *Participant Profile*

Our sample ( $n = 130$ ) ranged from 65 to 95 years of age (mean = 74.8; standard deviation [SD] = 7.15) with 16 women over age 85. More (87) lived independently than in senior housing (43), and many in senior housing lived independently in their own homes. Most (91.5%) were white, retired (83.3%), married (41.3%) or widowed (42.1%), and highly educated (52.7% had completed college); nearly all (96.1%) wore glasses and most (91.2%) wore bifocals or trifocals. About 35% ( $n = 45$ ) indicated that they participated in a regular organized exercise program, usually 2-3 times per week, and most of the women ( $n = 96$ ) indicated that they participated in exercise on their own (usually walking) an average of 4.4 times per week. We had purposely selected a sample including about half who had fallen ( $n = 63$ ), and they described the circumstances of the fall. Most (56.5%) falls involved tripping over obstacles (eg, steps, boxes, sidewalks), and very few women reported serious injuries.

### *Descriptive Information*

We examined internal reliabilities before considering relationships among measures. With all 12 activity efficacy items, internal consistency was good, all items contributed, and the overall  $\alpha$  ( $\alpha = .92$ ) was stronger than the  $\alpha$  for any subsets (eg, walking). Internal consistencies for the six subscales of the GWB ranged from .57 to .72, and the  $\alpha$  (.89) for the total was stronger with all items contributing. Although the seven HWB ratings were not designed as a scale, we examined the internal consistency to consider combining the ratings into a total score. All HWB ratings were interrelated with an overall  $\alpha$  of .86.

The YPAS total time, total intensity, and total index scores were calculated, but we included only the total time and total index scores in our analyses. DiPietro et al.<sup>6</sup> reported that total time and intensity are highly correlated; we confirmed that in our data ( $r = .97$ ), and thus did not include the intensity score.

### *Correlational Analyses*

Table 1 includes the means and standard deviations for the overall psychological well-being measures (activity efficacy, GWB total, and HWB rating total), and Table 2 includes that information for the separate HWB ratings and GWB subscale scores. Both tables also include the correlations of each of these measures with age and with the two activity measures (total time, and total index).

Generally, psychological well-being scores were high and positive. Psychological well-being was not correlated with age at all, with no signs of decreasing well-being with age. Most HWB ratings and the overall well-being scores were correlated with activity, however, with the women who reported greater activity reporting more positive well-being.

### *Multiple Regression Analyses*

We conducted stepwise multiple regression analyses, with age, total time, and total index as the predictors of each of the psychological well-being measures, activity efficacy, GWB total, and HWB rating total, to determine the relative

**Table 1.** MEANS AND CORRELATIONS WITH AGE AND ACTIVITY FOR OVERALL WELL-BEING MEASURES

Measure	Mean (SD)	Correlations with		
		Age	Time	Index
Activity efficacy	318.3 (89.9)	-.25*	.22*	.39*
GWB total	79.1 (17.4)	.03	.09	.13
HWB rating total	24.6 (4.4)	-.03	.27*	.40*

SD, standard deviation.

\* $P < .01$ .

**Table 2.** MEANS AND CORRELATIONS WITH AGE AND ACTIVITY FOR WELL-BEING SUBSCORES

Measure	M (SD)	Correlations with		
		Age	Time	Index
GWB subscores				
Anxiety	18.2 (4.5)	.06	.03	.07
Depression	15.9 (3.5)	-.05	.10	.12
Positive well-being	10.3 (2.8)	.04	-.01	.14
Control	11.8 (2.5)	.01	-.02	.02
Vitality	13.1 (8.6)	.07	.04	.07
Health	9.5 (3.9)	.01	.17	.08
HWB ratings				
Health	3.8 (.79)	.07	.14	.28†
Fitness	3.5 (.79)	.14	.21*	.33†
Confidence	3.5 (.83)	-.03	.16	.28†
Concentration	3.5 (.85)	-.15	.21*	.35†
Body satisfaction	3.1 (.91)	-.01	.24†	.31†
Mood	3.7 (.90)	-.02	.16	.13
Energy	3.3 (.98)	-.05	.24†	.30†

SD, standard deviation; GWB, general well-being schedule; HWB, health and well-being ratings.

\* $P < .05$ .

† $P < .01$ .

contributions of age and activity in predicting psychological well-being. We then followed these three main analyses with similar stepwise regression analyses with each of the separate HWB ratings and GWB subscales as criterion variables.

All three main stepwise regressions yielded similar results. The total activity index was the first and only predictor of the three psychological wellbeing measures. The final multiple  $R$  and  $F$  values for the regressions are given in Table 3. The relationships for activity efficacy and the specific health and well-being ratings were stronger than the relationship for general well-being. Notably, age did not contribute to any of the regressions. Follow-up regression analyses with the GWB subscales yielded no significant relationships (ie, no predictors were entered for any of the separate subscales), likely reflecting the overall weak relationship for general well-being. Follow-up regressions with the separate HWB ratings paralleled the main regression results (see Table 3). Total activity index was the first and only predictor on nearly every rating. For the rating of fitness, total activity index was the first predictor, but age also entered the regression. Notably, the  $R$  weight for age was positive, indicating that when activity levels were similar, older women reported higher fitness. This suggests

that activity may counter the expected decreases in perceived fitness with age. In all other cases, total activity was positively related to the separate health and well-being ratings, paralleling the overall regression.

## DISCUSSION

Overall, the older women in this study were healthy, active, well-functioning adults. Their activity scores were similar to those reported by DiPietro et al.<sup>6</sup> for their slightly younger sample. According to the typical GWB classification,<sup>8</sup> scores below 60 reflect severe distress; those from 61 to 72, moderate distress;

**Table 3. MULTIPLE REGRESSION RESULTS WITH AGE AND ACTIVITY PREDICTING PSYCHOLOGICAL WELL-BEING MEASURES**

<i>Criterion Measure</i>	R	F	<i>Predictor</i>	$\beta$
Overall psychological well-being measures				
Activity efficacy	.39	21.18*	Index	.39*
GWB total	.18	4.05†	Index	.18†
Rating total	.39	21.09*	Index	.39*
Separate HWB ratings				
Health	.25	7.60‡	Index	.25†
Fitness	.42	12.32*	Index	.41*
			Age	.26‡
Confidence	.28	9.88‡	Index	.28‡
Concentration	.35	16.48*	Index	.35*
Body satisfaction	.29	11.09‡	Index	.29‡
Mood	.19	4.87†	Index	.19†
Energy	.34	15.96*	Index	.34*

GWB, general well-being schedule; HWB, health and well-being ratings.

\* $P < .001$ .

† $P < .05$ .

‡ $P < .01$ .

and those above 73 reflect positive well-being. Activity efficacy scores were very high, with many women indicating they were 100% confident on most items.

Although our participants represented a relatively wide age range of older women, age was not related to psychological well-being as typically reported. Age was slightly related to activity ( $r = -.27$  for time;  $r = -.25$  for index), indicating a slight decline in activity with age; however, only activity, not age, was related to measures of efficacy and well-being. Apparently, the benefits of maintaining activity outweigh the effects of increasing age for perceived health and well-being. Activity was more strongly related to the activity efficacy measure and specific health and well-being ratings than to general well-being. Those differential findings reflect the importance of specific measures as suggested by self-efficacy researchers; however, even more general ratings (eg, health, concentration, sense of confidence) were positively related to activity, suggesting that the benefits extend beyond specific physical measures.

Overall, our results confirm the value of physical activity for older women. Women with higher levels of activity in their daily lives reported greater psychological well-being on all our measures. Moreover, many women commented during their visits with us on the importance of physical activity, and their comments reflected the physical, mental, and emotional value of activity in their lives. Most of these women did not participate in organized exercise programs, but stayed active through walking, yardwork, and other daily life-style activities. Researchers and those who work with older adults in community health programs might consider these findings and try to encourage and help older women find ways to maintain activity in their daily lives. We know activity yields physical health benefits, and the current findings suggest that even moderate activity also yields considerable psychological benefits.

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## REFERENCES

1. United States Department of Health and Human Services. Healthy people 2000: national health promotion and disease prevention objectives. Washington (DC): U.S. Government Printing Office, 1990.
2. Blair SN, Kohl HW, Paffenbarger RS, Clark DG, Cooper KH, Gibbons LW. Physical fitness and all-cause mortality: a prospective study of healthy men and women. *JAMA* 1989;262:2395-401.
3. Nieman DC. Fitness and sports medicine: a health-related approach, 3rd ed. Palo Alto (CA) Bull Publishing, 1995.
4. McAuley E, Rudolph D. Physical activity, aging, and psychological well-being. *J Aging Phys Activity* 1995;3:67-96.
5. Blair SN, Kohl HW, Gordon NF, Paffenbarger RS. How much physical activity is good for health? *Ann Rev Public Health*, 1992;13:99-126.
6. DiPietro L, Caspersen CJ, Ostfeld AM, Nadel ER. A survey for assessing physical activity among older adults. *Med Sci Sports Exerc* 1993;25:628-42.
7. King AC, Taylor CB, Haskell WL, DeBusk RF. Influence of regular aerobic exercise on psychological health: a randomized, controlled trial of healthy middle-aged adults. *Health Psychol* 1989;8:305-24.
8. McDowell I, Newell C. Measuring health: a guide to rating scales and questionnaires. New York: Oxford University Press, 1987.