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STUDY OF PHYSICAL EDUCATION TO OBTAIN SELF-CONFIDENCE FOR PHYSICAL ACTIVITY IN STUDENTS

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ABSTRACT

Physical activity rates have been shown to decline over the lifespan. In an attempt to combat this decline, researchers have been completing several types of studies in order to understand why this trend has been occurring. Descriptive studies attempt to understand more about the determinants of physical activity. The results of these studies have shown only weak to moderate correlations with physical activity. Intervention studies have also been completed to try to change behavior - many of which claim to use theory-based interventions. Although these studies may produce modestly successful results immediately post-intervention, long-term success has not been reported. Since many intervention studies claim to be theory-based but do not measure theoretical constructs, it is difficultto determine if the short-term change in behavior is due to the intervention or some other factor. It seems that an intermediate step between descriptive studies and intervention studies is lacking. Therefore, the purpose of this study is to complete a construct validation of a physical activity intervention on the subjects' knowledge and use of 8 self-regulation strategies: self-monitoring for PA,goal setting for PA, social support for PA, environmental aid for PA, self-reinforcement for PA, time- management for PA, self-efficacy for PA, and tailoring for PA.

INTRODUCTION

Sallis et al. (1992) reviewed the literature on determinants of physical activity in youth, as well as interventions aimed at this group.(Sallis, 1992) They found that achievement motivation, stress tolerance, social adequacy, movement satisfaction, self-confidence, and independence all had little or no correlation with physical activity. Attitudes toward physical activity had weak to moderate correlations. The determinants that were strongly associated with physical activity were self-efficacy and intentions involving exercise. This review grouped both children and adolescents together under one heading entitled "youth". It may be more beneficial to keep children and adolescents separate, since psychosocial development is quite different in these two groups.

Reynolds et al (1990) looked at the determinants of physical activity in adolescents. (Reynolds et al., 1990) A convenience sample was taken from 2 northern California high schools. The sample consisted of tenth graders, of which 388 were male and 355 were female. There was a problem with attrition, as 16-month measures included only 233 males and 141 females. Self-administered and physical measures were taken at baseline, 4 months, and 16 months. Physical activity and psychosocial measures were self-reported on a Likert scale. The

male regression model was consistent from four to sixteen months, but the female model decreased by almost half. Sallis et al. (1999) sought to explain change in physical activity over two years. (Sallis, 1999) Subjects included in the study were fourth graders from seven suburban public schools. Lindquist et al looked to identify the sociocultural determinants of physical activity in children.(Lindquist, 1999) Data was used from a longitudinal study of childhood obesity in Alabama. The majority of children were in their second or third year of the study (mean=10 years). Independent variables for the study included: gender, age, single parent home, pubertal development and social class. Gender, age, and single parent home status were all categorical variables. Pubertal development was measured using a physical exam as described by Tanner stages. Social class was measured using the Hollingshead four- factor index of social class, which uses a combination of educational achievement and occupation of parents. Values range from 8 - 66, where higher values suggest higher socioeconomic status. No validity or reliability information was given for any of the measures. Dependent variables included in the study were television viewing, physical fitness (max VO2), hours per week of exercise, days per week of exercise, physical educationexercise hours per week, and sports team participation. Television viewing, reported byparents, was measured in hours per day.

The scores were than averaged to assess the child's physical activity. Physical education participation was assessed using methods similar to the Youth Risk behavior survey, where they were asked how many days in the past week they engaged in physical activity that made them sweat or breathe hard for at least 20 minutes(Lindquist, 1999) This number was then multiplied by the number of days that they reported having physical education class. Correlations between the variables of television viewing, hour/week of exercise, days/week of exercise, physical education exercise, sports teams, maximal oxygen consumption, and adjusted oxygen consumption were low to moderate. Regression analysis was completed using sociocultural and physiological variables on each physical activity measure. Sociocultural factors explained 12% of the variance in television viewing, and they explained 13% of the variance in exercise. Sociocultural factors explained 14% of the variance in physical education exercise, 11% of the variance in sports team participation, and 85% of the variance in max VO_2. Measurement of key variables was questionable in this study. No validity or reliability information was given, and some of the measures, such as the way they measured physical education exercise, have questionable validity. A small percentage of students actually vigorously exercise in physical education.

Anderssen et al. looked to ascertain if parents and peers influenced levels of leisure time physical activity. (Anderssen & Wold, 1992) The sample consisted of 904 seventh graders (498 boys, 406 girls) in western Norway. All measures were self-report in nature. One-week test-retest reliability for the question, "Outside of school hours, how often do you do sports or exercise until you are out of breath or sweat?" was reported as .78. The predictor variables measured were leisure-time physical activity of significant others, direct support of physical activity from significant others, direct help from parents, and value of physical activity or significant others. Predictor variables were measured using multiple-choice

answers, ranging from "4 days or more" to "never". Results showed that boys exercised more than girls. Activity of best friend was moderately correlated with physical activity for boys and girls, r = .23 and r = .31, respectively. Direct help in exercising vigorously was also correlated moderately with physical activity (r = .33). Direct support for physical activity also had low to moderate correlations (r = .13 - .30). Multiple regression analysis using direct help,leisure-time physical activity of others, and direct support for physical activity on the adolescent's activity showed that 14% of the variance in adolescent activity was accounted forin boys, and 16% of the variance in physical activity was accounted for in girls. Although the explained variance was moderately low, it is important to consider that this variance isexplained by social support alone. Other studies using multiple variable models explain similar amounts of variance in activity. Therefore, this study provides evidence that social support may be a strong influential factor for adolescent physical activity behavior.

Vilhjalmsson, et al. examined a large sample of adolescents to measure determinants of physical activity. (Vilhjalmsson & Thorlindsson, 1998). A random sample was drawn from all adolescents in Iceland. Of this sample, 94% returned the questionnaire, yielding 1131 in the total sample. Of these 1131, 49% were female, and 39% were lower class, 27% were middle class, and 34% were upper class. Numerous variables were measured, includingothers' physical activity, school experiences, attitudes and beliefs, sociability, emotional support, other activities, medical condition, and physical activity. Physical activity was measured using a two-item summary scale that asked how often the children participated in "sports, gymnastics, swimming, or other physical activities." (Vilhjalmsson & Thorlindsson, 1998) Others' physical activity was measured using a three-point scale, which ranged from never to at least once a week. School experiences were assessed by asking if the student had received health and sport behavior instructions, and whether the "value of sport and exercise" had been emphasized. Attitudes and beliefs were uncovered by ranking one's perceivedimportance of variables such as sport, improving health, control over health, etc. on a three- point scale. Sociability was found by asking the students how easy or hard it was to make friends. Emotional support, broken into five categories, was found by one question askinghow hard it was to talk to a support person. The strongest correlations came from best friend'sphysical activity (r =.384) and importance of sport (r = .223). A multiple regression analysisof sex, importance of sport, importance of health improvement, father's physical activity, older brother's physical activity, satisfaction with gym class, sociability, friend's emotional support, paid work, TV-viewing, and interaction between friend's physical activity and friend's emotional support accounted for 25% of the variance in physical activity.

Douthitt et al. wanted to look at psychological variables to determine if they had an effect on exercise behavior. (Douthitt, 1994) The researchers collected data in May 1990 and in September 1990. The first data collection asked to students to answer the questions in relation to their physical education experiences. The second asked for students to relate the questions to their physical activity over summer break. Ninth, tenth, and eleventh grade students (94 male, 38 female) in a suburban high school in Denver, Colorado were recruited for the first data collection. At the second data collection, 110 of the original sample were

available, 77 males, 33 females. The criterion measure was adolescent exercise adherence, measured by the Habitual physical activity questionnaire as well as the Sport Index. Dependent variables measured were self-perception, self-motivation, perceived control, and personality/sport congruence, measured by the Adolescent Self-Perception Profile, Self-Motivation Inventory, Perceived control at School Scale, and the Psychosocial Activity Dimensions Profile, respectively. Neither validity nor reliability information was reported in the study. Data were separated into structured and unstructured activity settings (physical education versus summer activity), as well as competitive versus noncompetitive groups (answering yes to a question about involvement in competitive athletics). For females, perceived athletic competency accounted for 26% of the variance in exercise adherence in the physical education setting. For males in the physical education setting, perceived romantic appeal accounted for 8% of the variance. In unstructured settings, perceived global self-worth (18%) and perceived physical appearance (14%) were significant for females. As a complete group, the unstructured data showed that personality/sport congruence accounted for 29% of the variance in exercise adherence. In the noncompetitive group, perceived romantic appeal accounted for 10% of the variance in exercise adherence. This study was unique, in that they looked at personality/sport congruence, which accounted for a moderate amount of variance in the unstructured group.

Cardina, in an unpublished dissertation, used Social Cognitive Theory to try to explain variance in physical activity in high school students. (Cardina, 1994) Subjects from the ninth and twelfth grades at Newark High School in completed self-report measures. Of the original 349 subjects, 256 completed the study. The independent variables included in the study were: social situation, self-efficacy for skill/ability, self-efficacy for barriers, physical appearance outcome expectations, general health outcome expectations, negative outcome expectations, social outcome expectations, and self-regulation. Test-retest reliability was conducted in a pilot study, and values ranged from .64 - .86. In all subjects, the model consisting of self- regulation, social outcome expectancies, and self-efficacy explained 31% of the variance. Thesame model applied only to ninth grade females showed that 43% of the variance in physical activity was explained. In ninth grade males, using self-efficacy, social situation, and physicalappearance, the model explained 29% of the variance in physical activity. In the twelfthgrade, 37% of the variance was explained by self-regulation in females, 13% in males.

Trost et al. (Trost, 1997) completed a one year prospective study on rural fifth grade students. Psychosocial variables, such as support seeking self-efficacy, self-efficacy to overcome barriers, competing activities, social influences regarding physical activity, and beliefs about the outcomes of physical activity and environmental variables, such as perceived physical activity of parents and peers, attitude toward physical education, access to facilities and equipment, participation in school and community sports and activities were assessed. For self-efficacy and social influences, Trost modified scales used by Reynolds et al (1990). Physical activity was assessed using a previous day physical activity recall, which measured after-school activity. This instrument has been previously validated against motion sensorsand heart rate monitors, with concurrent validity values of .77 and .63, respectively. (Weston, Petosa, & Pate, 1997) Physical activity measures were taken on three consecutive days during

school. Follow-up measures were taken one year later. Results showed that boys were more active than girls in both moderate to vigorous physical activity and vigorous physical activity. Both boys and girls scored similarly on the determinant measures, with only outcome beliefs being significantly higher for girls than boys. The significant regression model for girls in predicting vigorous physical activity included participation in community sports, self-efficacy for overcoming barriers, enjoyment of physical education, race/ethnicity, and mother's physical activity, accounting for 26% of the variance. For boys, only the barriers subscale of self-efficacy was significant, accounting for 5% of the variance in vigorous physical activity. For moderate and vigorous physical activity, only community sports participation and the barriers subscale for self-efficacy were significant for girls, accounting for about 17% of the variance. For boys, outcome beliefs and community sport participation were significant predictors of moderate and vigorous physical activity, accounting for 17% of the variance. A strength of this study was the use of a prospective design. Many other studies look at concurrent physical activity behavior, and fail to attempt to predict behavior. This study looked at predicting future exercise behavior from determinants measured at baseline.

METHODOLOGY

Permission from The State University's Institutional Review board was attained prior to the study. The Falk school is a laboratory school for the University of Pittsburgh, so parental permission for their child's participation in research studies was required prior to student's enrollment in the school. In a typical year, the physical education instructor would see each group of students twice - once for health and once for physical education. The fitness intervention took place during the time allotted for health, since the teacher felt that the material typically covered in health class was being taught in other subjects. Permission to replace the health unit with a new fitness unit was granted by the school's director. The 25- day unit consisted of 17 lessons. Fitness equipment, such as a treadmill, stationary bike, elliptical trainer, and physio balls, was incorporated into the lessons. At baseline, studentheight and weight were assessed, and the students completed the self-control instrument. If students did not understand the item, questions were addressed on an item-by-item basis. Follow-up data was assessed on the last day of the intervention.

CONCLUSIONS

To date, few construct validations of physical activity interventions have been completed.(Calfas, 1997; Edmundson, Parcel, Feldman, & Elder, 1996) Many researchers skip from descriptive literature to large-scale studies to change physical activity. One intermediate step, construct validation, would help researchers decide if the results of the study were actually due to the intervention. A construct validation involves evaluating whether or not the intervention impacted theoretical constructs. If theoretical constructs are shown to change significantly in a construct validation, then next logical step would be to test if the intervention changes behavior.

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