

Effect of Knowledge of Exercise Benefits on Attitude, Motivation, and Exercise Participation

by

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Abstract

The purpose of this study was to analyze the effect knowledge of exercise benefits had on attitude, motivation and exercise participation in individuals within the age group of 18-50 years. University students, on-campus staff, and community members participated in this study. One hundred participants responded to four questionnaires, the Exercise Motivation Inventory (EMI-2), the International Physical Activity Questionnaire (IPAQ), the Locus of Causality for Exercise Scale (LCE), and a self-made Knowledge Questionnaire. The results of this study showed that knowledge of exercise benefits did not affect physical activity participation ($p=0.591$) and attitude towards exercise ($p = 0.605$) but significantly affected motivation to exercise ($p= 0.0005$). It was concluded that knowledge of exercise benefits was not the primary factor affecting physical activity participation.

Preface and Acknowledgement

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Chapter 1

Introduction

Background

Exercise is the energetic movement of the body for the sake of physical fitness (Norkins, 1998) Whereas, physical activity is a complex dynamic process (Sherwood & Jeffery, 2000). These two terms are closely-related to one another, with one being used by the “common” person and the other by sport individuals such as physical therapists, sport psychologists, and athletes, respectively. The positive effects of exercise are well-known, few of them include: reducing stressors and improving the overall physical and psychological well-being of individuals (Sinyor & Schwartz, 1983). Regular physical activity improves myocardial function, maintains or increases myocardial oxygen supply, and increases the electrical activity of the myocardium (Fang et al., 2003). Sherwood and Jeffery (2000) found that most adult men and women, in spite of the well-documented health benefits of exercise, are found to be inactive. Hence, creating further awareness of exercise benefits is a public health priority and of utmost importance.

Students enrolled in undergraduate and graduate programs are often unable to dedicate sufficient time to exercise due to the expectations of their academic programs or other high priorities (Daskapan et al., 2006). This limitation (lack of time) to exercise may or may not be the decisive factor for physical activity participation of college students. Depending upon exposure to exercise and the access individuals have to the various exercising facilities, one might expect that most of the population would have fewer reasons not to exercise. Despite this fact, Reichert, Barros, Domingues and Hallal (2007), found that, in spite of well-recognized benefits of physical activity, millions of college students are physically inactive. Some of the major factors affecting the physical activity participation include, to motivation to exercise, barriers to physical activity,

attitude towards physical activity, the various community and environmental factors and knowledge of exercise benefits (Daskapan et al., 2006, James et al., 2003, Bauer et al., 2004). Out of these factors the knowledge variable is less researched and has mixed reviews. Thus the focus of this study was to identify the relationship between knowledge of exercise “benefits” and amount of exercise participation in college students, college faculty/staff, and Cortland community members within the age group of 18-50 years. If this relationship is strong enough, it could help the researchers to make recommendations for improving this awareness related to physical activity in a large population.

One might expect knowledge to ultimately influence attitudes toward exercising. Subsequently, attitude can be predictive of motivation to exercise (Craeynest, M., Crombez, G., Houwer, J.D., Tanghe, A. T., & Bourdeaudhuij, A.D.2006). Yet, it remains unclear if knowledge of exercise benefits could affect motivation to exercise. If individuals are aware of the benefits, they may not know the minimum amount of physical activity to attain these benefits. How much knowledge of exercise benefits plays a role in physical activity participation is unclear as various investigations and studies published in this field are somewhat equivocal. Thus, the aim of this study was to find answers to these questions and to make a significant contribution to the present awareness of the importance of physical activity.

Statement of Purpose

The purpose of this study was to determine how much one’s knowledge regarding the benefits of exercise affects attitude, motivation, and exercise participation within a local community.

Research hypothesis

It was hypothesized that one's knowledge of exercise benefits would significantly affect the amount of physical activity participation. It is also hypothesized that a greater knowledge of exercise benefits would significantly affect one's attitude and motivation towards exercise participation.

Assumptions

1. It was assumed that the participants honestly provided information on the informed consent and fully completed the paper and pencil questionnaires.
2. It was assumed the developed Knowledge Questionnaire reflects its validity and reliability.

Limitations

The study was limited to the honesty by which each participant answered the questionnaires. Also physical and psychological well-being of the participant on the day the questionnaire was answered honestly. Lastly the reliability of the self-made Knowledge Questionnaire.

Delimitations

The study was delimited by the subjects included both, on (SUNY Cortland) and off-campus individuals between 18 and 50 years of age. Also the season of the year(summer) which can cause a difference in the responses to the physical activity questionnaire(IPAQ).

Significance of the study

To date, very limited research exists which has analyzed the level of knowledge associated with exercise benefits on physical activity participation. (Hopman-Rock, M., Borghouts, J., & Leurs, M. (2005), Ferguson, K. J., Yesalis, C. E., Pomrehn, P. R. & Kirkpatrick, M. B. (1989). It

is also unclear as to the relationship of exercise benefits on one's attitude and motivation towards exercise participation. The results of this study could potentially give insights into the influence that one's basic knowledge regarding the benefits of exercise has. Moreover, throw light on the amount of physical activity participation, and also towards, the motivation to exercise participation. It is hoped that these results will guide exercise instructors about the importance of teaching more about exercise benefits to individuals, with whom they interact, thus in turn increasing the frequency of their physical activity leading to a healthier lifestyle.

Operational Definitions of Terms

Attitude.

Jung defines attitude as "The readiness of the psyche to act or react in a certain way" (Jung, 1971).

Exercise Motivation Inventory-2.

The Exercise Motivation Inventory (EMI-2) is a tool used to assess exercise participation motives in order to examine how such motives influence the choice of activities undertaken (Markland & Hardy, 1993).

International physical activity questionnaire.

The International Physical Activity Questionnaire (IPAQ) is an instrument utilized to provide a set of well-developed instruments that can be used internationally to obtain comparable estimates of physical activity (Booth, 2000).

Locus of causality for exercise scale.

The Locus of Causality for Exercise Scale (LCE) is a 3-item scale designed to assess the self-determination and attitude individuals possess towards exercising regularly (Deci & Ryan, 1985)

Moderate physical activity.

Physical activity performed for 20 minutes for three days in a week, which puts considerable stress on the cardiovascular and respiratory systems (Murphy, Nevill, Biddle, & Hardman, 2002).

Physical activity.

The Center for Disease Control (CDC) defines physical activity as bodily movements produced by the contraction of skeletal muscles that increases the energy expenditure above the basal level (CDC, 1999, p.20).

Vigorous physical activity.

Physical activity performed for 60 minutes in a day, for five days in a week, which causes increase in heart rate and heavy breathing (Murphy et al., 2002).

Chapter 2

Review of Literature

Introduction

The initial section of the review of literature will be highlighting various recommendations to exercise and physical activity. The second section of this chapter will discuss the attitudes and barriers towards physical activity and will be followed by behavior and basic knowledge one possesses about exercising. The third section of the review will discuss the role environment plays in motivating individuals towards physical activity. In the final section, common individual and environmental barriers to physical activity will be discussed as well as the importance of promoting physical activity.

Exercise participation is determined by diverse criteria such as individual and environmental factors (Sherwood & Jeffery, 2000). Individuals are engaged in physical activity for both intrinsic and extrinsic reasons (Allison, K.R., Dwyer, J.M., Goldenberg, E., Fein, A., Yoshida, K.K., & Boutillier, M, 2005). The most common intrinsic reasons to participate in physical activity are enjoyment, challenge, and skill development, whereas the common extrinsic reasons to participate in physical activity are socialization, maintaining an attractive appearance, and gaining a good reputation (Allison et al., 2005). Moreover, the importance of exercise and its impact on the overall effective functioning of the body is well-documented (Dielh B, 2011). Yet, it is seen that more than 40% of the student population is inactive (Keating, X., Jianmin, G., Piñero, J., & Bridges, D. 2005). This physical inactivity may be due to lack of knowledge of physical activity benefits or lack of motivation to exercise. The importance of exercise motivation has evolved through this basic idea of the psychological and physical benefits that individuals experience after exercising. However, the interrelationships of exercise knowledge, exercise motiva-

tion, and actual participation in physical activity are still unclear in some respects. This chapter will explore some of these interrelationships.

Physical Activity

As defined by CDC physical activity is the bodily movements produced by the contraction of skeletal muscles that increases the energy expenditure above the basal level. Given below are few recommendations to increase the available physical activity among children young adults and elderly.

Recommendations.

The Council on Sports Medicine and Fitness and Council on School Health (CSMFCSH) (2006) reported in a recent policy statement that the prevalence of pediatric obesity has reached epidemic proportions. Furthermore, they suggested that it is unlikely that the medical profession alone will be able to solve this serious health problem. According to the American Academy of Pediatrics (AAP), recommendations for physical activity among preschool-aged and young children (4-6 years of age), should include free play with an emphasis on fun, playfulness, exploration and experimentation while being mindful of safety and proper supervision. Furthermore, preschoolers should also begin walking tolerable distances with family members and reduce sedentary transportation by car and stroller (CSMFCSH, 2006).

The National Center for Chronic Disease Prevention & Health Promotion (NCCDPHP, 1996) has found that nearly half of the youth (12-21 years) are not vigorously active. About 14% of young people have no recent history of physical activity. According to the AAP, adolescents are highly social and are often influenced easily by their peers. Thus, identifying activities that are of interest to the adolescent, especially those that are fun and include their friends is crucial for long-term participation. According to the AAP, examples of physical activities for adoles-

cents may include personal fitness preferences, such as dance, yoga, running, walking and cycling, and competitive and noncompetitive sports.

Hence it is evident that to promote physical activity it is important to incorporate activities that are of interest to the exercising population. Also, it is necessary to create environments that are conducive to exercising and which make exercising an interesting and pleasant experience.

Young adults.

There are certain benefits and barriers to physical activity among young people. (Daskapan, Tuzun, & Eker, 2006). Daskapan, Tuzun, and Eker (2006) conducted a study to analyze perceived barriers to physical activity among Turkish young male and female university students. The study used a self-administered questionnaire that consisted of 12 items. The most commonly cited physical activity barrier was lack of time due to study commitments and responsibilities related to family and social environment.

The CDC conducted a National Health Interview Survey in 1992, and found that nearly half of American youth aged 12-21 years were not vigorously active on a regular basis. Inactivity was more common in females (14%) as compared to males (7%). The participation in all types of physical activity declined strikingly as age or grade in school increased.(CDC, 1992).

Attitude.

Brug, Lechner, and Devries (1995) found that one of the possible causes of obesity could be behavioral patterns which include attitudes toward exercise. Craeynest, Crombez, Houwer, Deforche, and Bourdeaudhuij (2005) conducted a study to investigate the differences in “personal” explicit and implicit attitudes towards physical activities between overweight children and a lean control group. The implicit attitude was measured using the Extrinsic Affective Simon Task

(EAST) and explicit attitudes were assessed by self-reports. They found that there were no differences between the two groups in the explicit attitude towards the physical activity. However, children and adolescents with obesity had a more pronounced positive implicit attitude towards food in general.

In a follow-up study by (Craeynest et al.,2006), the researchers investigated whether an implicit self-concept was related to fat versus non-fat food, and exercising versus sedentary lifestyle in children with and without obesity. Additionally, self-reported attitudes towards physical activity and food were assessed using a Likert rating scale. It was found that youngsters with and without obesity had similar explicit attitudes towards physical activity. Additionally, it was found that both groups were neutral towards non-fat food and mildly positive towards sedentary lifestyle, exercising, and fatty foods.

Leisure-time.

Amesty (2003) mentioned that leisure-time physical activity and exercise are behaviors that are particularly complex to understand as they are highly influenced by a number of factors. Amesty (2003) conducted a study to analyze barriers to leisure-time physical activity in the Hispanic population in the United States (U.S). The results showed that individual behavior, along with residency, were the two most important obstacles to physical activity. Haapanen, N.N., Miilunpalo,S., Pasanen, M., Vuori,I Oja, P., & Malmberg, J.(2000) found that an increase in leisure time physical activity among 35 to 63-year old Finnish men and women seemed to have a beneficial effect on the mortality risk of obese and non-obese women. Additionally, it seemed to have a similar effect on fit and unfit subjects.(Haapanen et al.,2000)

Role of Environment.

The applications of health behavior theories, to physical activities have identified the role of environmental influences, most often in terms of barriers. (Humpel, Owen, & Leslie, 2002). McCormack, G., Giles- Corti, B.G., Lange, A, Smith, T., Martin, K., & Pikora, T.J. (2004) mentioned that environment has the potential to influence physical behaviors; and as such, creating supportive environments has the potential to increase physical activity.

Humpel et al., (2002) examined the association between physical environmental factors such as accessibility of facilities, opportunities for activity, weather, safety and aesthetic conditions to physical activity. The researchers found that accessibility, opportunities, and aesthetic attributes have significant associations with physical activity whereas, weather and safety showed less strong relationships with physical activity. Even still the researchers suggested future research should be conducted in order to identify possible casual relationships (Humpel et al., 2002).

The Canadian Fitness and Lifestyle Research Institute (CFLRI) (1996) investigated the causes of physical inactivity in young adults. They grouped these causes into major, moderate, or minor. Both individual and environmental causes were shown to affect physical activity. Lack of time, lack of energy, and lack of motivation were the major causes for physical inactivity among individuals.

From these studies it is seen that environmental factors play an important role in physical activity participation. Environmental factors like accessibility of facilities and aesthetic attributes significantly affect physical activity. Whereas factors like weather and safety measures showed a lesser relationship with physical activity. Hence, creating environments favorable for physical activity is of prime importance in promoting physical activity participation.(Keating et al.,2005).

Barriers

Barriers are defined as factors or processes, which restrict or block one's main activity. The three types of barriers like perceived, individual and environmental barriers are discussed as follows.

Perceived.

The perceived barriers to physical activity were broadly classified into two categories as internal and external barriers. (Daskapan et al., 2006). The internal barriers were grouped into three subcategories: lack of energy, lack of motivation, and lack of self-efficacy. Also, external barriers were grouped into three categories: lack of resource, lack of social support, and lack of time (Daskapan et al., 2006).

Several studies reported "lack of time" as the most important external barrier to physical activity. (Zunft et al., 1999; Daskapan et al., 2006; Sutjaho et al., 2004; and Allison et al., 2005) Whereas "lack of energy" was the most important internal barrier to physical activity according to several researchers (Daskapan et al., 2006; Reichert et al., 2007; Phillips et al., 2009). In a study by Menon (2008), it was seen that that lack of will power (98.5%) was the most important barrier to physical activity. Lack of time (94%), lack of energy (91%), and social influence (86%) were also some of the important barriers cited by the participants. It was concluded that intrinsic (internal) barriers were more relevant as compared to extrinsic (external) barriers in young sedentary adults.

Individual factors.

According to the Canadian Fitness and Lifestyle Research Institute (CFLRI) (1996), excessive cost, illness or injury, feeling uncomfortable, lack of skill, and fear of injury are some of

the moderate barriers to physical activity. As reported earlier, Daskapan et al., (2006) found that lack of time and lack of energy were the most important barriers to physical activity among university Turkish students. Furthermore, it was found that lack of time due to a busy lesson schedule, and lack of time due to responsibilities relative to family and social environment, were the most commonly cited barriers among the university students (Daskapan et al., 2006). Zunft et al. (1999) found that work or study commitments were the most frequently cited barriers for not increasing participation in physical activity in young adults. Sutjaho et al. (2004) conducted a study that found the most commonly perceived barriers to physical activity among young women were lack of motivation, lack of time, excessive cost and lack of skill. Allison et al. (2005) found that inaccessibility was one of the most important external barriers to physical activity among adolescent males. Furthermore, cost, lack of facilities, and health programs were cited as some of the structural determinants to physical inactivity among adolescent males (Allison et al., 2005). These were few of the individual barriers which were studied while conducting this study.

Environmental factors.

According to the CFLRI (1996), lack of safe places, lack of child care, lack of partner, insufficient programs, lack of support, and lack of transportation were some of the minor environmental barriers to physical activity. Safety concerns have been studied extensively and a relationship has been found between the area of residence and fear of crime among Hispanics (Amesty, 2003). Additionally, social support was found as the strongest predictor of physical activity (Amesty, 2003). Sutjaho et al. (2004) conducted a study among young women and found that women with children reported lack of social support as an important barrier to physical activity. Additionally, some of the less commonly reported barriers included lack of partner or friends, lack of information, lack of children support, and inaccessibility.(Sutjaho et al, 2004).

Knowledge of Exercise Benefits

Knowledge of exercise benefits is the core research topic, with respect to this study. The following section talks about the influence of knowledge of exercise benefits on physical activity participation, whether it strongly affects one attitude, motivation and participation towards physical activity or not.

Physical Activity.

The research literature has some data, which throws light on the effect of knowledge of exercise benefits on physical activity participation. Keating, Guan, Pinero, and Bridges, (2005) conducted a meta-analysis and found that 40% to 50% of college students are physically inactive. The analysis pointed out three main problems about research in this area: (1) college students' physical activity has been seriously neglected as a research topic; 2) there is a lack of multiple-level approaches (i.e., personal, psychosocial, and environmental levels) for examining physical activity behaviors in the college student population; and (3) measures of physical activity are subjective and inconsistent, which makes comparisons of physical activity patterns among different samples very difficult or impossible (Keating et al., 2005).

Knowledge - Less/not Crucial Factor.

Dishman, Sallis, and Orenstein (1985) reviewed the known determinants of physical activity and found that knowledge of, and belief in, the health benefits of physical activity may motivate initial involvement, but the feelings of enjoyment and well-being seemed to be stronger motives for continued participation in health programs. Also, no evidence supported the idea that increased knowledge about exercise leads to enhanced exercise participation. (Dishman et al., 1985).

In an attempt to review and update the evidence relating to personal, social, and environmental factors associated with physical activity in adults, Trost, Owen, and Bauman (2002) found that the barriers to physical activity emerged as a strong influence, whereas knowledge related to health and physical activity had a poor association with physical activity. Also, Morrow, Krzewinski-Malone, Jackson, Bungum and FitzGerald (2004) concluded that physical activity knowledge alone was not sufficient enough to elicit a behavior; however, it provided educators with an understanding of the public's physical activity knowledge that could be helpful in developing health promotion and physical activity interventions.

Young, Haskell, Taylor, and Fortman (1996) studied the effectiveness of community-wide health education on physical activity knowledge, attitudes, self-efficacy, and behavior in residents aged 18-74 years in four central California cities. The results showed little consistent evidence of a treatment effect on physical activity knowledge, attitudes, or self-efficacy in either men or women. These results underscore the need for development of more effective interventions to change in physical activity than is provided by a broad-based, community-wide education program.

In another study, by Nahas, Goldfine, and Collins (2003), the determinants of physical activity were analyzed. It was found that although the benefits of physical activity are becoming increasingly apparent, the knowledge of these benefits alone has not motivated the population to adopt and maintain regular physical activity. The maintenance of physical activity to retain its benefits is a complex process, reflective of multiple influences that include interpersonal, intrapersonal and environmental variables.

Knowledge – Crucial Factor

The predictors of vigorous and moderate physical activity in a community were studied by Sallis, William, and Fortman (2004). It was seen that maintenance of vigorous activity was predicted by attitudes towards physical activity. Incorporation of moderate physical activity in daily routine was predicted by health knowledge, and maintenance was predicted by specific exercise knowledge, female gender, and self-efficacy. In another study by Hopman-Rock, Borghouts, and Leurs (2005), various other determinants of exercise participation included attitude, social influences, self-efficacy, age, sex, education, knowledge about the health effects of exercise, habits, stage of change in exercising, and perceived barriers. The results of this study showed that the best predictors of intention to participate were: attitude, social influences, self-efficacy, age, and gender. Actual participation was best predicted by age (higher), gender (female), intention, knowledge, and the (lower) number of perceived barriers. Similarly, Ferguson, Yesalis, Pomrehn, and Kirkpatrick (1989) also found that middle school student's attitudes towards physical education and knowledge about the benefits of exercise contributed significantly and independently to current exercise behavior.

The relationships among physical activity and age, education, marital status, income, primary language, among Caribbean and Hispanic women living in New York, was studied by Giardina et al. (2002). It was seen that physical activity and education were significantly related. Women who had completed their graduation had greater total activity time than those with some high school education. Within an undergraduate population, Tsigilis, Koustelios, and Theodorakis (2007), observed that the inclusion of two cognitive variables, namely information and knowledge, appeared to be appropriate for examining students' participation in university exercise programs.

Elderly.

The studies performed in the elderly population showed that there was a relationship between knowledge of exercise benefits and exercise participation. Rhodes, R. E., Martin, A. D., Taunton, J. E., Rhodes, E. C., Donnelly, M. M., & Elliot, J. J. (1999) reviewed the literature concerning factors at the individual level associated with regular exercise among older adults. They found that education and exercise history correlated positively with regular exercise, while perceived physical frailty and poor health provided the greatest barrier to exercise adoption and adherence in the elderly. Moreover, Boyette, L.W., Lloyd, A. A., Boyette, J. E., Watkins, E. E., Furbush, L. L., Dunbar, S. B., & Brandon, L. J. (2002) suggested that older adults who are in good health and have a history of exercise activity might be more likely to participate in long-term exercise programs.

Howze, Smith, and DiGilo (1989) suggested that knowledge of exercise skills and benefits are associated with participation and adherence in the elderly. Since knowledge increases with experience and exposure, it is hypothesized that there may be a relationship between early exposure to exercise and long-term adherence (Kasch, 2001). It is suggested that increased knowledge and participation can increase self-efficacy, thus improving adherence (Prochaska & DiClemente, 1979). Knowledge about health, fitness, and exercise behaviors has not been found to directly determine the adherence of physical activity among middle-aged and younger adults. However, knowledge about exercise has been associated with predicting participation and adherence to a structured exercise program among older adults. Knowledge may be important in the initial adoption of exercise (Rhodes et al., 1999). Understanding the benefits of exercise may lead towards intention to exercise. Moreover, increasing a person's belief in his or her ability to

maintain an exercise program and achieve health and physical goals has been shown to increase adherence (Young, 2005).

Patient population.

Some of the studies to test the “knowledge” variable were performed on patient populations. These included studies performed on Jordanian myocardial infarction patients (Nahla, 2004), people with disabilities (Junker & Carlberg, 2011), African-American patients with type-2 diabetes (Dutton, Johnson, Whitehead, Bodenlos, & Brantley, 2005), and on patients with osteoarthritis (Petursdottir, Arnadottir, & Halldorsdottir, 2010). In these studies, the subjects were prescribed an exercise program and the level of patient participation in these programs was assessed. It was seen that the common barriers to participation in these intervention programs included lack of: time, knowledge of the exercise program, social support, and equipment; as well as medical and physical barriers to activity. It was concluded that these intervention programs should consider culture, socioeconomic status, personal system, and demographics of the patients. Moreover, increased knowledge and understanding of the personal and contextual factors influencing exercise participation in people with these disorders should be considered by the physical therapists and other health care professionals before initiating and implementing the exercise programs.

Exercise adherence.

Robertson, and Mutrie (1989) investigated the factors associated with low adherence to exercise in a British population. Factors such as group exercise, reasons for exercise, knowledge, psychological benefits, body weight, self-motivation, and reasons for stopping exercise were examined. The results of this study showed that female adherers as compared to female non-adherers were much more highly self-motivated, had much more knowledge about exercise

physiology, were thinner, and claimed that the psychological benefits from a fitness program helped them adhere. Male adherers had different reasons for exercising and had more knowledge about exercise physiology when compared to male non-adherers.

NurAishah and Omar-Fauzee (2003) explored the psychological effects of exercise behaviors, based on the theory of reasoned action, and its relevance to exercise adherence. The results of this study showed that understanding and interpreting individual exercise behaviors might provide keys to help motivate individuals adhere to exercise. Variables influencing exercise adherence and strategies for behavior changes must be understood, and knowledge must be applied to individual situations, to assist, develop, and maintain habits of exercise and exercise adherence.

From these studies, it remains unclear as to whether knowledge about the benefits of physical activity is a primary factor in exercise participation. It is also uncertain whether increased levels of knowledge will contribute to an increase in exercise participation. If knowledge of the benefits of physical activity significantly affects exercise participation, this could suggest that more time be spent in educating individuals through various avenues, such as wellness programming, college courses in health and physical activity, and community advertisements dedicated to the benefits of exercise.

Promoting Physical Activity

Latham (1999) considered promoting physical activity as a guide to improving life-style among community members. She discussed various foundations for physical activity, strategies for changing physical activity behavior, strategies for planning and implementing a new intervention, and various resources for action. Furthermore, she suggested that the key to success is to equip people with knowledge and skills, to practice those new skills to provide a supportive envi-

ronment, and to address some of the biggest physical or political barriers that prevent people from being physically active.

Summary and Rationale

Most studies have determined the various barriers to physical activity, and have identified the role of environment and individual factors on physical activity participation. However, whether or not the "knowledge of exercise benefits" affects an individual's motivation to participate in physical activity still has mixed reviews. Some studies support that knowledge about the benefits of exercise is one of the crucial factors that positively affects individuals' physical activity participation (Hopman et al., 2005; James et al., 2003; Ferguson et al., 1989). While, other studies show "neutral" to "no" effects of knowledge on participation in regular physical activity (Dishman et al., 1985; Nahas et al, 2003; Trost et al., 2002). These studies describe environment, personality factors and availability of time for physical activity as primary barriers negatively impacting individuals' participation in physical activity. Considering the disparity in the available literature, the effects of knowledge about exercise benefits on participation in physical activity remains unclear, demanding further investigation.

This study aimed to explore and analyze these effects at greater lengths. This study also considered other factors that affect exercise participation including motivation, attitude and self-determination. If this study were to conclude that knowledge is one of the most crucial factors positively affecting the level of physical activity participation, it could be used as an important tool in increasing awareness towards healthy exercise habits, thereby promoting healthy lifestyles and building healthier populations.

Chapter 3

Methods

Introduction

This chapter provides an overview of the methodology and procedures to be utilized for analysing the effect of knowledge of exercise benefits on physical activity participation, attitude and motivation. Information is provided regarding the participants targeted for this study. It also discusses the various instruments, and their importance, that were utilized for data collection and analysis.

Participants

Individuals were sought from the SUNY Cortland campus as well as the surrounding community. These individuals included males and females within the age range of 18-50 years. Each participant was informed of the risks associated with the study via the informed consent form. The final study protocol was approved by the SUNY Cortland Institutional Review Board (Appendix A). The details of the study protocol are included in Appendix B.

Instruments

The Exercise Motivation Inventory (EMI-2) (Markland & Hardy, 1993), International Physical Activity Questionnaire (IPAQ) (Booth, 2000) and Locus of Causality for Exercise Scale (LCE) (Deci & Ryan, 1985) were used. An additional “original and self-made instrument” was incorporated to evaluate the knowledge of participants regarding the benefits of physical activity.

EMI.

The EMI was developed and used in the School of Sport, Health, & Exercise Sciences, University of Wales, and Bangor. It was used for assessing participation motives in order to examine the problem of exercise adherence and individual reasons for exercising in determining

long-term adherence to standard physical activity. The development and initial assessment of the reliability and validity of the EMI are described by Markland & Hardy (1993). The original EMI did not assess some obvious fitness-related reasons for exercising and health-related subscales focused on the avoidance of ill-health, hence, neglecting potential positively-oriented health-related motives. A number of users or potential users of the EMI have pointed out that it would be useful to assess the reasons that non-exercisers might have for taking up exercise. Thus, the EMI was modified and the EMI-2 was developed which is applicable to both exercisers and non-exercisers and comprised of 14 subscales. EMI-2 has been found to discriminate between individuals at different stages during changes of exercise (Ingledew, Markland & Medley, 1998).

IPAQ.

The IPAQ was developed by Booth, in Geneva, in 1998, and was followed by extensive reliability and validity testing undertaken across 12 countries (14 sites) during 2000. It was used to assess the physical activity of the subjects within the past seven days. The activities were divided into five parts dealing with vigorous and moderate physical effort done over the last seven days.

LCE.

The LCE was initially developed using both exploratory and confirmatory factor analyses. Markland (1999) found that self-determination, as measured using the LCE, moderated the effects of perceived competence on intrinsic motivation. This instrument was used to assess the attitude the participants possessed towards physical activity participation. Responses to the LCE were scored on a Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree). High scores indicated greater self-determination or a more internal perceived locus of causality, and

lower scores indicated less self-determination to exercise. The reliability of this instrument was ($r = 0.83$).

Knowledge Questionnaire.

The Knowledge Questionnaire was a self-made questionnaire with 15 items on it. The questions were based on the benefits of exercise, mode of exercising, and the overall basic knowledge about importance of exercise. A pilot study utilizing this questionnaire was conducted to validate its effectiveness. The questionnaire was given once in the classroom and later was made available to the students via email. Eighteen students completed the questionnaire twice and the data was analysed using the SPSS software. A test-retest analysis was conducted and the results showed that the questionnaire had a reliability of ($r = 0.883$).

Procedures

The study design was descriptive in nature and involved the use of closed-ended instruments (EMI-2, IPAQ, LCE, and Knowledge Questionnaire). For on-campus data collection, the instruments were administered in classrooms, during class time, for students. On-campus adults (faculty and staff) completed the instruments at a pre-determined time and place at their convenience. Off-campus data collection was conducted at stores where the manager of the store gave approval to use their site for this study. All four surveys, EMI-2, IPAQ, LCE, and Knowledge Questionnaire were administered together. Before completing the survey, the participants were given a brief introduction to the purpose of the study and the reason for collecting data from them. The surveys were given at the same time on the same day. The participation in the survey was anonymous and voluntary. The participants who chose to participate were asked to complete four sets of questionnaires: one for EMI-2, one for IPAQ, one for the LCE, and one for the knowledge test. The participants who were not comfortable in answering a particular question

were free to skip that question and proceed with the survey. The participants were encouraged to ask questions that they had while completing the questionnaire.

In the first section of the EMI-2 instrument, the participants were requested to provide information regarding demographics (e.g. age, sex) and information regarding levels of physical activity. Following this, the participants were asked to complete the EMI-2. This questionnaire consisted of 51 closed-ended questions which were aimed at finding how well people were motivated to exercise and to determine the long-term adherence to regular physical activity (Markland and Hardy, 1993). All the questions were scored on a six-point Likert scale that ranged from “not at all true for me” (0) to “very true for me” (5). Some questions of the instrument were related to self-motives. The other questions dealt with pressured or forced motives, such as “I am asked by my doctor to work out.” The fourteen subscale scores were calculated using the excel spread sheet designed by Dr.Sudhesh Kannan .The items scores were entered in the excel sheet and these subscale scores were generated automatically

<http://www.FitnessLogistics.com/articles/ExerciseMotivations.html>). These subscale scores were obtained by calculating the means of the appropriate items. These subscale scores were used to analyze the motivation variable with the knowledge variable. The individual subscales scores were correlated with the knowledge score and the final conclusion about one’s motivation was derived. The subscales included stress management, revitalization, enjoyment, challenge, social recognition, affiliation, competition, health pressures, ill health, avoidance, positive health, weight management, appearance, strength, endurance, and nimbleness.

In the second instrument, the IPAQ, subjects provided information regarding the physical activity done over the past seven days. This instrument consisted of 27 closed-ended questions, and the participants were given the choice to skip the question, if not applicable. The IPAQ grad-

ing protocol was used to calculate the cumulative score of the participants. Based on this protocol, the participants were classified as having low, moderate or high physical activity. According to the protocol, individuals who performed physical activity for seven or more days a week for at least 20 minutes were considered to be “highly” active. Those who performed physical activity for five or more days for at least 20 minutes were considered to be “moderately” active. Individuals who didn’t meet the above two criteria were considered to have “low” physical activity.

The third instrument, the LCE, consisted of three closed-ended questions. This instrument was used to assess the extent to which individuals felt that they chose to exercise rather than feeling that they had to for some reason. All three questions were graded on a Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). To score the LCE, the scores on question two and three were reversed and then the mean for all the three questions was calculated.

The last instrument, the Knowledge Questionnaire, provided basic information that the participants possessed regarding exercise importance. This instrument consisted of 15 closed-ended questions. All questions were scored on a Likert scale 5 (strongly agree) to 1 (strongly disagree). The final knowledge score was calculated by adding the scores on these questions. Individuals who had a score in the range 38-46 were considered to have a high knowledge score, and the individuals who scored below this range were considered to have a low knowledge score.

Calculations

All together, the participants were asked to answer 96 questions, 51 on the EMI, 27 on the IPAQ, three on the LCE, and 15 on the Knowledge Questionnaire. Participants were instructed to circle the appropriate answers given in each survey. The self-reported demographics were used to differentiate the participant population. The EMI-2 score, IPAQ score, and the LCE

score were analyzed with the knowledge score to determine their individual relationship with the knowledge variable.

Statistical Analysis

The data analysis was done using SPSS version 17 for windows. An alpha level of 0.05 was used for all the tests. Multiple variance of analysis (MANOVA) was first performed on the means scores obtained from the four survey instruments.

In order to determine if the hypothesis might present a legitimate question, a pilot study was conducted. Within the pilot study, 46 participants (n = 23 kinesiology majors, n = 23 education majors) completed all four instruments and data was analyzed using SPSS software. Multivariate analysis of variance (MANOVA) was conducted on the data. Post hoc and Tukey tests were also performed on the collected data. The results of the pilot study did show a significant difference in the motivation levels between the subjects from the freshmen level to senior level of college students. Also, the knowledge score of the two groups had a significant difference ($p < 0.05$). The kinesiology majors had a significantly higher score than the education majors. The score from the physical activity questionnaire (IPAQ) revealed that those who scored high also had a high level of motivation (EMI-2 scores). Those that scored lower on the IPAQ were found to be less motivated towards physical activity. This suggests that knowledge level could be a primary reason for the level of physical activity participation.

Chapter 4

Results and Discussion

This chapter provides the results of the study in regard to subject characteristics, motivation scores (EMI-2), physical activity score (IPAQ), locus of causality for exercise score (LCE) and the knowledge scores (Knowledge questionnaire).

Results

Subject characteristics: The demographic characteristics of the subjects were determined using descriptive statistics in SPSS for windows (Version 17).

Table 1

Demographic characteristics of Subjects (n) = 100

Sex	Males (<i>n</i>)	52
	Females (<i>n</i>)	48
Mean Age (yrs.)	Males	27.40 +6.28*
	Females	26.42 + 5.03*
Population	Students (<i>n</i>)	51
	Community Members (<i>n</i>)	26
	On-campus staff members (<i>n</i>)	23

*Standard deviation

One hundred participants took part in the survey of which, 52 were males and 48 females. Ten participants were eliminated from the study, from the middle knowledge score range to achieve an equal distribution of subjects with respect to their knowledge scores. (See Figure 1).

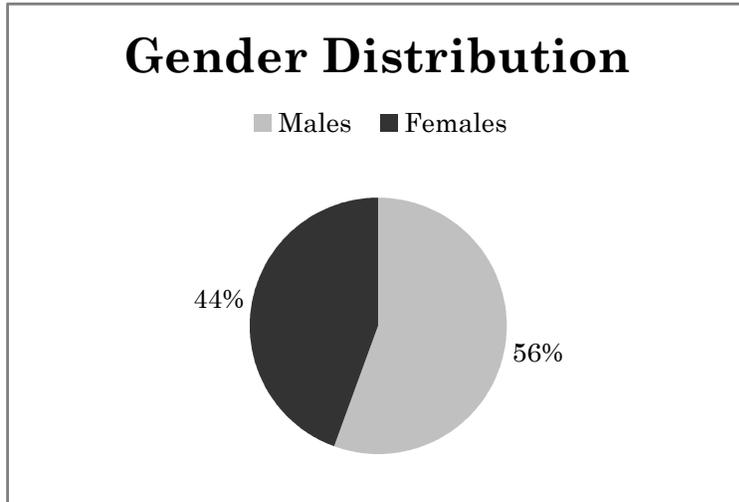


Figure 1. Percent (%) Distribution of participants

The age distribution graph showed that most of the participants that took part in the study fell in the age group of 18-32 years. Maximum number of participants was in the age group of 18-20 years. (See Figure 2).

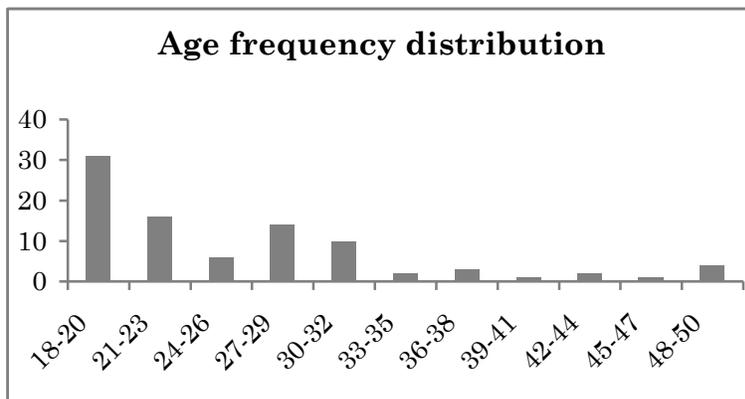


Figure 2. Age Distribution of participants

Motivation.

The EMI-2 score indicates the level of motivation the participants possess towards actual exercise participation. The motivation scores significantly correlated with the knowledge score. The individuals, who had a high knowledge score, had a high EMI-2 score and vice-versa. The mean of the EMI-2 score for group with high knowledge was ($M = 174.76$) and for group with low knowledge was ($M = 140.96$) (See Figure 3).

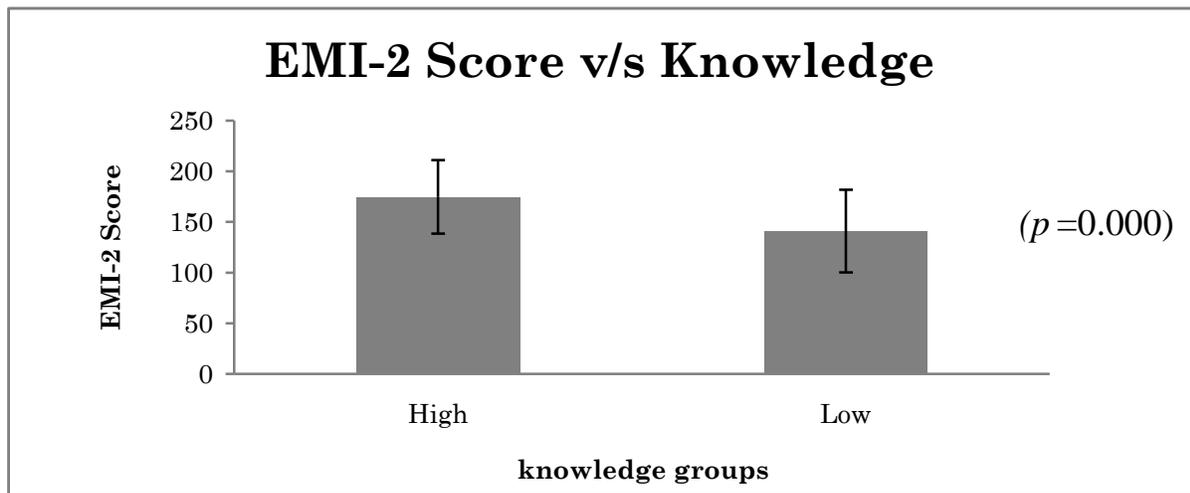


Figure 3. Comparison of knowledge scores with respect to EMI-2 score

Physical Activity Participation.

The IPAQ score indicated how much the participants were active at the time of the study. Most of the participants in the study were moderately active. Thirty-eight percent of the subjects who participated in the study were moderately active, whereas twenty-eight percent of subjects reported a low level of physical activity. The remaining thirty-four percent of subjects had high levels of physical activity based on the grading protocol. The IPAQ score did not correlate with the knowledge score ($p = 0.591$) (See Figure 4).

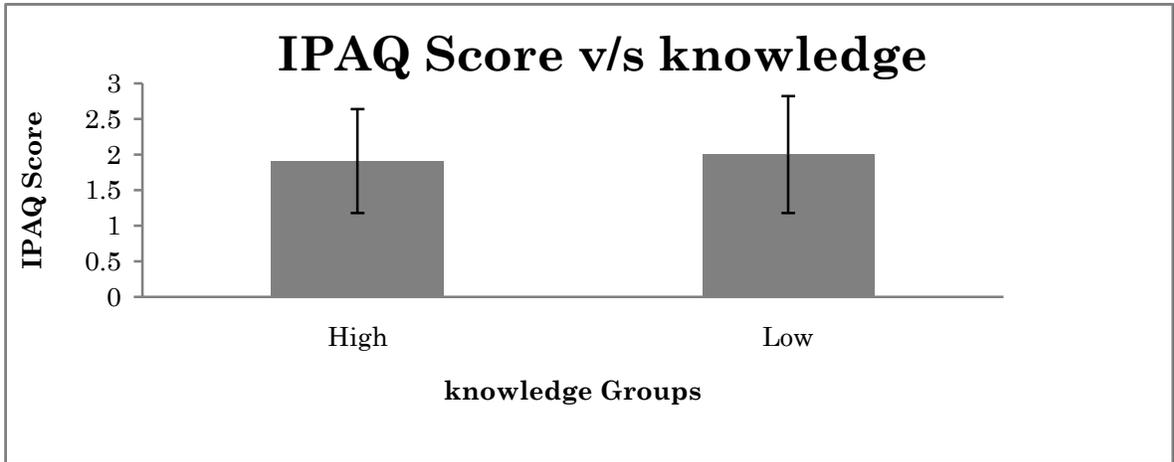


Figure 4. Comparison of Knowledge score with respect to the IPAQ scores

Locus of Causality for Exercise Scale.

LCE determined the level of self-determination and attitude the individuals possessed toward exercise. The LCE score did not correlate with the knowledge score ($p = 0.605$) (See Figure 5).

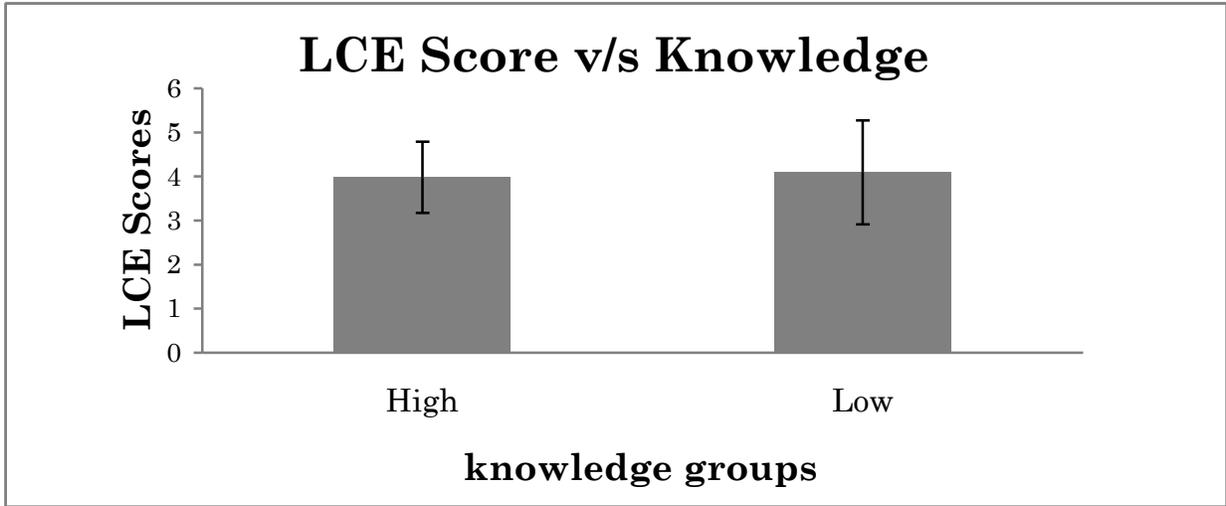


Figure 5. Comparison of knowledge score with respect to the LCE score

Knowledge Score.

The knowledge score was calculated using the knowledge questionnaire, on a 5-point Likert scale. Individuals who had a score in the range of 38-46 were considered to have a high

knowledge score and the individuals who scored below this range, were considered to have a low knowledge score.

Relationships between motivation, physical activity, knowledge and locus of causality

A one-way between subjects MANOVA was run using EMI-2, IPAQ, and LCE. There was a significant effect of knowledge on the combined dependent variables, $F(3, 86) = 7.140$, $p = 0.0005$ Wilks' lambda = 0.801, partial eta squared value = 0.199. Follow up on each of the individual dependent variables, using a Bonferroni adjusted alpha level of 0.017, showed that there was a significant contribution of the EMI-2 score $F(1,88) = 17.24$, $p = 0.0005$, partial eta squared value = 0.164. But there were no significant contributions of the IPAQ score $F(1, 88) = 0.292$ $p = 0.591$, and LCE score $F(1, 88) = 0.270$, $p = 0.605$.

Therefore, knowledge of exercise benefits did affect one's motivation to exercise. The individuals who had higher knowledge score, had higher motivation ($M= 174.756$) whereas, individuals who had lesser knowledge were seen to have lower motivation scores ($M=140.956$). Also, there was no effect of knowledge on the overall exercise participation and the attitude towards exercise. Thus, even though individuals are knowledgeable regarding the benefits of exercise and are motivated to exercise, they are not physically active. Individuals who are aware of the benefits of exercise do not appear to be applying this knowledge in their day- to-day activities.

Discussion

The results from this study showed that knowledge of exercise benefits did not have a significant effect on the physical activity participation among the sample population used in this study. This finding was consistent with the previous studies (Dishman, Sallis & Orestein, 1985; Trost, Owen, & Bauman, 2002). Most of these studies showed that feelings of enjoyment and

well-being were stronger motives for continued participation in physical activity. Hence, knowledge was not the primary factor affecting physical activity participation. Various internal and external barriers to physical activity, which were not included in this study, could be responsible for this outcome. Moreover, the socio-economic and cultural status of the individuals living in the Cortland area could have affected their overall participation in physical activity. Hence, as the study was restricted to one particular campus and one single community, results differed from those in the past studies.

The present study assessed the effect of knowledge of exercise benefits on motivation and physical activity participation among college students and community members in Cortland New York. According to Fang, J., Rosett, J. W., Cohen, H. W., Kaplan, R.C., & Alderman, M.H. (2003), regular physical activity improves psychological health and cardiorespiratory fitness. Children, adolescence, and young adults have well-established patterns of participating in physical activity (Buckworth, 2001). Whether knowledge of exercise benefits affects these patterns remains equivocal from the various studies conducted in the past. The present study assessed the participant's knowledge of exercise benefits based on the self-made knowledge questionnaire and correlated it with their physical activity participation. Though the reliability of the self-made knowledge questionnaire was tested, different results would have been evident if another questionnaire testing their knowledge was utilized.

Further, the study reported that knowledge of exercise benefits did affect one's motivation towards exercise. In these individuals, levels of motivation towards exercise were directly proportional to the knowledge of exercise benefits. Consequently, individuals who had high knowledge of exercise benefits were more motivated to exercise. This finding was in accordance with the previous studies (Junker, & Carlberg, 2011; Robertson, & Mutrie, 1989). Thus, by edu-

cating individuals regarding the importance of physical activity, they can be better motivated to take part in physical activity.

One limitation of the present study that must be considered was that the research was carried out within one particular college campus and community. Hence, the participation was limited to the members of a specific community. Socio-cultural and economic profiles of the subjects who participated in this study may be different from individuals in the adjoining central New York areas. Also, the study was performed with a focus to determine if the “knowledge of exercise benefits” affects a particular age range. People who belong to other age groups may have different responses to how “knowledge of exercise benefits” affects their motivation to exercise. Hence, it was seen that knowledge of exercise benefits did affect the motivation to exercise, but did not affect the physical activity participation and the attitude to exercise. (See Figure. 6)

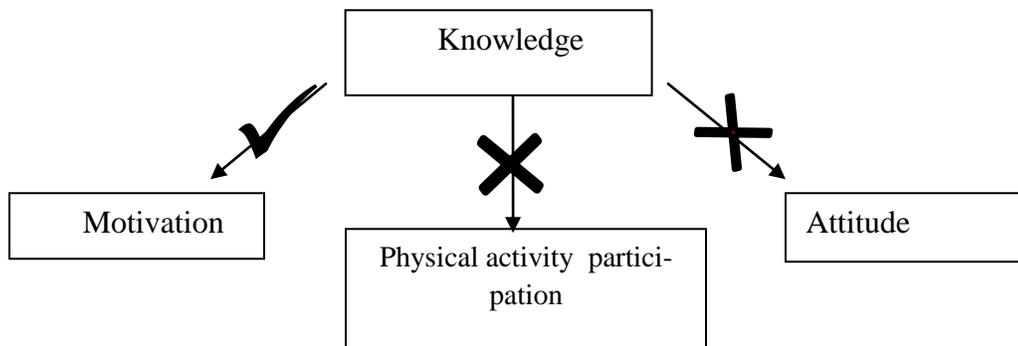


Figure 6 Graphical representation of summary of the results

Summary

The findings of this study do not support the hypothesis that knowledge of exercise benefits is a primary reason for physical activity participation. Some literature shows that knowledge of exercise benefits may be one of the factors affecting physical activity participation. (Hopman

et al., 2005; James et al., 2003; Ferguson et al., 1989). Studies indicating opposite results appeared to utilize different ages or different socioeconomic populations as compared to this study. (Dishman, Sallis & Orestein, 1985; Trost, Owen, & Bauman, 2002). In the future, the results of this study could help in improving on the current or existing interventions to promote physical activity among young adults. The questionnaires used in this study included and focused on “need to know” questions that could be answered easily. A large respondent rate occurred with the questionnaires. This helped in achieving the “aim” of the study which was analyzing the effect of knowledge of exercise benefits on exercise participation. Thus, the study sheds light on the fact that individuals who are knowledgeable about the benefits of exercise did not appear to be applying this knowledge in their day-to-day activities. Hence, though the individuals are motivated to exercise, they were not necessarily physically active.

Chapter 5

Summary, Conclusions, and Recommendations

Summary

The purpose of this study was to see if one's knowledge about the benefits of exercise affected one's attitude, motivation and exercise participation in a local community. There have been studies that have stated that knowledge is not one of the primary factors, -(Dishman, Sallis & Orestein, 1985; Trost, Owen, & Bauman, 2002), whereas some studies showed that knowledge was one of the primary factors influencing exercise participation (Hopman et al., 2005; James et al., 2003; Ferguson et al., 1989). The intent of the present study was to find out if knowledge of exercise benefits helps increase this particular sample population's motivation to take part in physical activity. One hundred participants volunteered to participate in this study. The study consisted of administering four questionnaires to students and faculty/staff on a college campus and to local community members. These questionnaires were anonymous and voluntary. In the first part of the study, the demographic details of the participants were recorded. Next, the participants were asked to fill out a motivation questionnaire, the Exercise Motivation Inventory-2 (EMI-2), which included 51 statements, relative to exercising. Additionally, the participant's current physical activity level was assessed based on the International Physical Activity Questionnaire (IPAQ). Next, the participants were asked to complete the Locus of Causality Questionnaire (LCE), which deals with the self-determination the participants possess to exercise. Finally, the participants were asked to fill out the Knowledge questionnaire, which dealt with the basic knowledge participant's possessed regarding the benefits of exercise. The data analyses were performed using SPSS for Windows (Version 17). The results of the study showed that knowledge of exercise benefits did affect one's motivation to exercise. The individuals who had

a higher knowledge scores had higher motivation ($M= 174.756$) whereas, individuals who had a lesser knowledge were seen to have lower motivation scores ($M=140.956$). Data suggests that there was no effect of knowledge of exercise benefits on overall exercise participation. Thus, even though individuals are aware of the benefits of exercise and are motivated to exercise, it was seen that they were not necessarily physically active. This finding corresponded with another study in the related literature which was conducted by Dishman, Sallis, and Orenstein (1985).

Conclusions

Based on the statistical analysis of the data, the following conclusions were made:

1. Knowledge of exercise benefits affects motivation to exercise of 18-50 year olds on the SUNY Cortland campus and surrounding Cortland community.
2. Knowledge of exercise benefits did not affect the physical activity participation of 18-50 year olds on the SUNY Cortland campus and surrounding Cortland community.
3. Knowledge of exercise benefits did not affect the attitude towards exercise of 18-50 year olds on the SUNY Cortland campus and surrounding Cortland community.

Recommendations

Based upon the conclusions reached in this study, future research could benefit by following these recommendations:

1. Since it was found that knowledge of exercise benefits did affect one's motivation to exercise, but did not relate to exercise participation, one might investigate this gap between exercise knowledge and exercise participation.
2. It would be desirable to engage an even larger population and additional communities to confirm the findings of this study.

3. The present study indicated that individuals were knowledgeable about the benefits of exercise, but were still not necessarily physically active. Hence, future research should focus on incorporating “barriers to physical activity” as a potential confounding variable to this research.
4. Since the results of the study differ from previous research, it would be important to examine specific barriers in a given community before establishing a regimented physical activity intervention program in order to understand potential road-blocks.
5. Future studies should consider incorporating gender vs. age variables for this type of investigation.

Abbreviations

AAP- American Academy of Pediatrics

CDC- Center for Disease Control

CFLRI- Canadian Fitness and Lifestyle Research Institute

CSMFCSH- Council on Sports Medicine and Fitness and Council on School Health

EMI-2 Exercise Motivation Inventory-2

IPAQ- International Physical Activity Questionnaire

LCE – Locus of Causality for Exercise Scale

NCCDPHP- National Center for Chronic Disease Prevention & Health Promotion

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Appendix A

Institutional Review Board Approval



MEMORANDUM

To: Sonia Chaubal
Phil Buckenmeyer

From: Amy Henderson-Harr, Chair
Institutional Review Board

Date: 06/30/2011

RE: Institutional Review Board Approval

In accordance with SUNY Cortland's procedures for human research participant protections, the protocol referenced below has been approved for a period of one year:

Title of the study:	Effect of Knowledge Of Exercise Benefits On Exercise Participation		
Level of review:	Exempt	Protocol number:	101157
Project start date:	Upon IRB approval	Approval expiration date*:	Note: Exempt research

* **Note: exempt research does not require continuation requests;** the SUNY Cortland IRB only requests annual email notification (to irb@cortland.edu) indicating that the research continues. The purpose of the continuation notification is to alert the IRB Administrator that the records of the original IRB approval must remain available. Unlimited continuations can be registered for exempt research under federal and SUNY Cortland IRB guidelines.

The federal Office for Research Protections (OHRP) emphasizes that investigators play a crucial role in protecting the rights and welfare of human subjects and are responsible for carrying out sound ethical research consistent with research plans approved by an IRB. Along with meeting the specific requirements of a particular research study, investigators are responsible for ongoing requirements in the conduct of approved research that include, in summary:

- obtaining and documenting informed consent from the participants and/or from a legally authorized representative prior to the individuals' participation in the research, unless these requirements have been waived by the IRB;
- obtaining prior approval from the IRB for any modifications of (or additions to) the previously approved research; this includes modifications to advertisements and other recruitment materials, changes to the informed consent or child assent, the study design and procedures, addition of research staff or student assistants, etc. (except those alterations necessary to eliminate apparent immediate hazards to subjects, which are then to be reported by email to irb@cortland.edu within three days);
- providing to the IRB prompt reports of any unanticipated problems involving risks to subjects or others;
- following the principles outlined in the Belmont Report, OHRP Policies and Procedures (Title 45, Part 46, Protection of Human Subjects), the SUNY Cortland College Handbook, and SUNY Cortland's IRB Policies and Procedures Manual;
- notifying the IRB of continued research under the approved protocol to keep the records active; and,
- maintaining records as required by the HHS regulations and NYS State law, for at least three years after completion of the study.

In the event that questions or concerns arise about research at SUNY Cortland, please contact the IRB by email irb@cortland.edu or by telephone at (607)753-2511. You may also contact a member of the IRB who possesses expertise in your discipline or methodology, visit <http://www.cortland.edu/irb/members.html> to obtain a current list of IRB members.

Sincerely,

A handwritten signature in black ink, appearing to read "Amy Henderson-Harr". The signature is fluid and cursive, with the first name "Amy" being particularly prominent.

Amy Henderson-Harr, Chair
Institutional Review Board
SUNY Cortland

Appendix B

Study Protocol

State University of New York College at Cortland

This study you have been asked to participate in is being conducted by Sonia Chaubal, a graduate student, through the Kinesiology Department at SUNY Cortland.

Purpose and Explanation of the Study

The purpose of this study is to determine if one's knowledge regarding the importance of exercise benefits affects their attitude, motivation, and participation in exercise. The information obtained from these anonymous questionnaires is expected to contribute to the field of exercise and health and may be used when developing future physical activity opportunities for people. Individuals from SUNY Cortland campus and the surrounding community between the ages of 18-50 years are invited to participate in this thesis research investigating the role of knowledge in exercise participation.

Procedure of the Study

The participants will be provided with four different instruments, Exercise Motivation Inventory-2 (EMI-2), International Physical Activity Questionnaire (IPAQ), Locus of Causality for Exercise Scale (LCE) and the Knowledge Questionnaire. The EMI-2 questionnaire will be dealing with the overall motivation of the participants towards exercise. The IPAQ questionnaire will focus on the physical activity undertaken by the participants. The LCE questionnaire will include questions relating to the self-determination participants possess regarding exercising. The Knowledge Questionnaire will provide basic information about what the participant knows about the benefits of physical activity. With this information regarding the four questionnaires, the participants will be asked to fill all the four questionnaires at the same time. This will take between 10-20 minutes to complete all four questionnaires. Participants will be encouraged to ask any doubts they have while filling out the questionnaires. Completing the questionnaires will be considered consent of participation in the study.

Risks and Discomforts

The reasonably foreseeable risks or discomforts associated with this study are fewer than risks or discomforts normally encountered in daily life.

Confidentiality

To ensure the privacy and confidentiality of the responses, these anonymous questionnaires and data will be secured safely. After the completion of the study, all the data will be destroyed. To maintain anonymity, participants will be encouraged not to type their name or any other information that might reveal their identity.

Freedom to Withdraw

Individual participation is voluntary; refusal to participate will involve no penalty or loss of benefits to which the individuals are otherwise entitled. Choosing to participate, refusal to participate, or withdrawal from study will not influence any of the participants' present or future standing at SUNY Cortland or in the community.

Appendix C

The Exercise Motivations Inventory - 2 (EMI-2)

On the following pages are a number of statements concerning the reasons people often give when asked why they exercise. *Whether you currently exercise regularly or not*, please read each statement carefully and indicate, by circling the appropriate number, whether or not each statement *is true* for you personally, *or would be true* for you personally if you did exercise. If you do not consider a statement to be true for you at all, circle the '0'. If you think that a statement is very true for you indeed, circle the '5'. If you think that a statement is partly true for you, then circle the '1', '2', '3' or '4', according to how strongly you feel that it reflects why you exercise or might exercise.

Remember, we want to know why *you personally* choose to exercise or might choose to exercise, not whether you think the statements are good reasons for *anybody* to exercise.

It helps us to have basic personal information about those who complete this questionnaire. We would be grateful for the following information:

Your age years

Your gender male/female

Personally, I exercise (or might exercise) ...	Not at all true for me	Very true for me				
1 To stay slim	0	1	2	3	4	5
2 To avoid ill-health	0	1	2	3	4	5
3 Because it makes me feel good	0	1	2	3	4	5
4 To help me look younger	0	1	2	3	4	5
5 To show my worth to others	0	1	2	3	4	5
6 To give me space to think	0	1	2	3	4	5
	Not at all true for me	Very true for me				

Personally, I exercise (or might exercise) ...

7	To have a healthy body	0	1	2	3	4	5
8	To build up my strength	0	1	2	3	4	5
9	Because I enjoy the feeling of exerting myself	0	1	2	3	4	5
10	To spend time with friends	0	1	2	3	4	5
11	Because my doctor advised me to exercise	0	1	2	3	4	5
12	Because I like trying to win in physical activities	0	1	2	3	4	5
13	To stay/become more agile	0	1	2	3	4	5
14	To give me goals to work towards	0	1	2	3	4	5
15	To lose weight	0	1	2	3	4	5
16	To prevent health problems	0	1	2	3	4	5
17	Because I find exercise invigorating	0	1	2	3	4	5
18	To have a good body	0	1	2	3	4	5
19	To compare my abilities with other peoples'	0	1	2	3	4	5
20	Because it helps to reduce tension	0	1	2	3	4	5
21	Because I want to maintain good health	0	1	2	3	4	5
22	To increase my endurance	0	1	2	3	4	5
23	Because I find exercising satisfying in and of itself	0	1	2	3	4	5
		Not at all true for me			Very true for me		

Personally, I exercise (or might exercise) ...

24	To enjoy the social aspects of exercising	0	1	2	3	4	5
25	To help prevent an illness that runs in my family	0	1	2	3	4	5
26	Because I enjoy competing	0	1	2	3	4	5
27	To maintain flexibility	0	1	2	3	4	5
28	To give me personal challenges to face	0	1	2	3	4	5
29	To help control my weight	0	1	2	3	4	5
30	To avoid heart disease	0	1	2	3	4	5
31	To recharge my batteries	0	1	2	3	4	5
32	To improve my appearance	0	1	2	3	4	5
33	To gain recognition for my accomplishments	0	1	2	3	4	5
34	To help manage stress	0	1	2	3	4	5
35	To feel more healthy	0	1	2	3	4	5
36	To get stronger	0	1	2	3	4	5
37	For enjoyment of the experience of exercising	0	1	2	3	4	5
38	To have fun being active with other people	0	1	2	3	4	5

**Not at
all true
for me**

**Very
true
for me**

Personally, I exercise (or might exercise) ...

39	To help recover from an illness/injury	0	1	2	3	4	5
40	Because I enjoy physical competition	0	1	2	3	4	5
41	To stay/become flexible	0	1	2	3	4	5

42	To develop personal skills	0	1	2	3	4	5
43	Because exercise helps me to burn calories	0	1	2	3	4	5
44	To look more attractive	0	1	2	3	4	5
45	To accomplish things that others are incapable of	0	1	2	3	4	5
46	To release tension	0	1	2	3	4	5
47	To develop my muscles	0	1	2	3	4	5
48	Because I feel at my best when exercising	0	1	2	3	4	5
49	To make new friends	0	1	2	3	4	5
50	Because I find physical activities fun, especially when competition is involved	0	1	2	3	4	5
51	To measure myself against personal standards	0	1	2	3	4	5

Thank you for completing this questionnaire

Appendix D

INTERNATIONAL PHYSICAL ACTIVITY QUESTIONNAIRE

We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the **last 7 days**. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

Think about all the **vigorous** activities that you did in the **last 7 days**. **Vigorous** physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think *only* about those physical activities that you did for at least 10 minutes at a time.

1. During the **last 7 days**, on how many days did you do **vigorous** physical activities like heavy lifting, digging, aerobics, or fast bicycling?

_____ **days per week**

No vigorous physical activities

Skip to question 3

2. How much time did you usually spend doing **vigorous** physical activities on one of those days?

_____ **hours per day**

_____ **minutes per day**

Don't know/Not sure

Think about all the **moderate** activities that you did in the **last 7 days**. **Moderate** activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think *only* about those physical activities that you did for at least 10 minutes at a time.

3. During the **last 7 days**, on how many days did you do **moderate** physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.

_____ **days per week**

No moderate physical activities

Skip to question 5

4. How much time did you usually spend doing **moderate** physical activities on one of those days?

_____ **hours per day**

_____ **minutes per day**

Don't know/Not sure

Think about the time you spent **walking** in the **last 7 days**. This includes at work and at home, walking to travel from place to place, and any other walking that you might do solely for recreation, sport, exercise, or leisure.

5. During the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time?

_____ **days per week**

No walking

Skip to question 7

6. How much time did you usually spend **walking** on one of those days?

_____ **hours per day**

_____ **minutes per day**

Don't know/Not sure

The last question is about the time you spent **sitting** on weekdays during the **last 7 days**. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

7. During the **last 7 days**, how much time did you spend **sitting** on a **week day**?

_____ **hours per day**
_____ **minutes per day**

Don't know/Not sure

This is the end of the questionnaire, thank you for participating.

Appendix E

Locus of Causality for Exercise Scale

	Strongly Disagree				Strongly Agree		
1 I exercise because I like to rather than because I feel I have to	1	2	3	4	5	6	7
2 Exercising is not something I would necessarily choose to do, rather it is something that I feel I ought to do	1	2	3	4	5	6	7
3 Having to exercise is a bit of a bind but it has to be done	1	2	3	4	5	6	7

Appendix F

KNOWLEDGE QUESTIONNAIRE

Question	Strongly Agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly Disagree (1)
1)Regular physical activity can prevent heart disease					
2)Regular physical activity converts fat to muscle					
3) Regular physical activity can help to improve health					
4)Regular physical activity shortens one's life span					
5)Regular physical activity doesn't increase the risk of developing depression and anxiety					
6)Regular physical activity can cause a drastic rise in blood pressure					
7)Regular physical activity helps engage in positive behaviors					
8)Regular physical activity helps maintain one's weight					
9)Regular physical activity is a key to sleeping better					
10)Regular physical activity decreases energy levels					
11)Regular physical activity is not a major part of leisure time					
12)Regular physical activity doesn't increase the risk of developing diabetes					

13)Regular physical activity doesn't increase the risk of premature death					
14)Regular physical activity affects the taste of food					
15)Regular physical activity affects one's eye color					