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The Contribution of Healthy Behaviors on Physical and Mental Health

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Abstract

Researchers show that healthy behaviors play an important role in improving physical and mental health. However, there is a little research that explores which healthy behavior factors would be more associated with physical and mental health. The purpose of this study was to examine the relationships among three intensity levels of physical activity (e.g., walking, moderate exercise, and strenuous activity), smoking, the quality of sleep, and diet, and physical and mental health. The 2004 Survey of Texas Adults was used to investigate factors that influenced the relationship between healthy behaviors and self-rated physical health and mental health for this study. Hierarchical multiple regression analysis was used to examine the contribution of health behavior variables on self-rated physical health and mental health. The results of this study show that quality of sleep, strenuous activity, moderate exercise, tobacco use, and age were positively associated with physical health. In addition, quality of sleep, strenuous activity, tobacco use, and demographic factors (e.g., age and gender) served as predictors of mental health. This study indicates that healthy behaviors can serve as an important vehicle for improving physical and mental health. It also suggests that individuals who pursue and engage in healthy behaviors may maintain and develop health and wellbeing.

Keywords: Healthy behaviors, Physical health, Mental health

1. Introduction

Researchers have identified multiple factors that contribute to healthy living. Physical activity, quality of sleep and diet, and limited/abstinence of tobacco and alcohol use all play important roles in improving and maintaining physical and mental health (Chasens et al., 2014; Ford, Zhao, Tsai, & Li, 2011; Kung, Hoyert, Xu, & Murphy, 2008). These authors concluded that healthy behaviors played an important role in improving physical and mental health. Numerous studies provide evidence that individuals who actively pursue and engage in healthy behaviors reported fewer psychological problems and concerns and increased physical and psychological benefits (e.g., Ahn & Fedewa, 2011; Kim et al., 2012; Reid et al., 2006; Sodergren et al., 2012). According to the Centers for Disease Control and Prevention (2014), healthy lifestyles are related to greater life expectancy. Therefore, understanding the causal relationship between healthy behaviors and overall health is essential to health care professionals, communities, families, and individuals.

Engagement in physical activity is perceived to be one of the major contributors to health and wellbeing. Empirical studies affirm that involvement in various physical activities leads to improved health and well-being including physical, social, and psychological benefits (e.g., Galper, Trivedi, Barlow, Dunn, & Kampert, 2006; Hall, Ekkekakis, & Petruzzello, 2002; Kasser & Kosma, 2012). Researchers demonstrate that by participating in physical activity, individuals experienced enhanced positive mood, increased physical strength, and improved

health perceptions (Kwag, Martin, Russell, & Franke, 2011; Wendel-Vos, Schuit, Tijhuis, & Kromhout, 2004). For example, Galper et al. (2006) found that physical activity alleviated depressive symptoms and increased emotional well-being. Similarly, Balboa et al. (2011) demonstrated that older adults who participated in frequent leisure-time physical activity enjoyed improved mental and emotional health, vitality, physical and social functioning, and reduced somatic discomfort.

Researchers have also explored the relationship between the intensity of physical activity and health benefits (Buman et al., 2010; Harvey et al., 2010; Nichols, Morgan, Chabot, 2000; Sirard, Melanson, Li, & Freedson, 2000). These studies provided evidence that participation in vigorous physical activity contributed more health benefits than moderate intensity physical activity participation. They stressed the importance of vigorous physical activity as a way of reducing anxiety and depression. For example, King et al. (2013) examined how different degrees of physical activity intensity (mean daily steps, active minutes, and high-cadence minutes) are associated with mental health. Individuals who engaged in high-intensity physical activity reported greater antidepressant effects than those participating in moderate intensity physical activity.

In spite of the positive effect of high-intensity physical activity, Kim et al. (2012) emphasized the value of moderate exercise for better mental health. They found that individuals who engaged in moderate exercise reported better mental health outcomes (e.g., a reduction in psychological distress, depression, and anxiety) in comparison to those in low- and high-intensity exercise groups. By participating in moderate intensity physical activity, individuals may maximize health-related benefits.

Along with the benefits of involvement in physical activity, researchers have considered the quality of sleep, diet, and tobacco use in relation to health (e.g., Darviri et al., 2011; Reid et al., 2006; Sodergren et al., 2012). These authors concluded that the quality of sleep, diet and non-smoking positively and closely associate with health. Individuals who experienced fair or poor sleep quality reported lower self-rated physical health and higher levels of depression and anxiety (Hale, 2013). They also found that smoking history was associated with poorer self-rated healthnon-smokers. In addition, Sodergren et al. (2012) found that individuals who pursued healthy diets (e.g., higher fruit and vegetable intake) increased physical health and well-being.

Conry et al. (2011) examined how various behaviors such as smoking, drinking, physical activity, and dietary patterns were related to mental health, self-rated health, and quality of life among Irish adults. They found that individuals who engaged in positive, healthy behaviors experienced low levels of psychological pain and high levels of energetic vitality. Their findings also indicated that two specific behaviors – limited or no smoking experience and healthy lifestyle - were indicators of elevated energy, vitality, health and quality of life, and reduced psychological distress.

To build on existing knowledge, we focused on healthy behaviors including three levels of physical activity intensity (e.g., walking, moderate exercise, and strenuous activity), the quality of sleep, diet, and tobacco use. We investigated the relationship between demographic

variables including age, gender, and physical and mental health. Therefore, the purpose of this study was to examine the relationships among three intensity levels of physical activity (e.g., walking, moderate exercise, and strenuous activity), the quality of sleep, diet, smoking, and physical and mental health.

2. Methods

2.1 Participants

The 2004 Survey of Texas Adults (STA, 2004) was used to investigate factors that influenced the relationship between healthy behaviors and self-rated physical and mental health. STA data was collected using a random probability sample with a computer-assisted telephone interview from November 2003 to January 2004. The participants of this data were 1,504 community-dwelling adults living in Texas. The study respondents were 39.5% men and ranged in age from 18 years to 94 years (Mean=44.46, SD=18.18). The sample was 64.9% Caucasian, 22.3% Hispanic or Latino, 7.0% African-American, 1.1% Native American, and 0.9% Asian. Fifty-eight percent were married, and 16.2% had never married. Nearly half of the participants were currently employed, and 17.3% were retired.

2.2 Measurements

2.2.1 Dependent Variable

A total of six items were used to measure mental health (e.g., “in the past 30 days how often did you feel so sad that nothing could cheer you up?" and "in the past 30 days how often did you feel nervous?"). In previous research, this scale was used to assess symptoms of non-specific psychological distress for a purpose of measuring perceptions of mental health (Hill, Burdette, & Hale, 2009; Acevedo, 2010). This scale consists of six sub-dimensions: (a) felt sad, (b) felt nervous, (c) felt restless or fidgety, (d) felt hopeless, (e) felt everything was an effort, and (f) felt worthless. Items are rated on 5-point Likert scale (1=very often and 5=never). Higher scores related to better mental health. Cronbach’s alpha for all six items in this study was .802.

Participants were asked to rate their overall health: “How would you rate your physical health at the present time?” Response categories ranged from 1 (excellent) to 5 (poor). This scale has been widely used to measure general physical health status (e.g., Hale, Hill, & Burdette, 2010; Kim, Dattilo, & Heo, 2011; Noel & Epstein, 2003). The item was reverse coded physical health; a higher score indicates a better positive self-rated physical health status.

2.2.2 Independent Variable

Health behaviors were measured using six items: (1) frequency of strenuous activity, (2) frequency of moderate exercise, (3) frequency of walking, (4) quality of diet, (5) quality of sleep, and (6) smoker type. The following question was used to measure the frequency of strenuous activity involvement, the following question was used: “On how many days in a typical week do you take part in strenuous activities like running, swimming, chopping wood, bicycling, lifting weights, playing tennis, or doing aerobics?” Moderate exercise was measured with a single question: “In a typical week, on how many days do you engage in

moderate exercise like playing golf, bowling, dancing, working in the yard, or gardening, but not including walking for exercise?" The frequency of walking activity was measured: "In a typical week, on how many days do you take walks, including walking to work, or exercise or for pleasure?" These three items related to the intensity of physical activity were evaluated using an 8-point Likert scale, ranging from zero (do not exercise) to seven (exercise every day).

The quality of diet was measured by "Overall, how would you rate the quality of your daily diet?" on a 5-point Likert scale (1=excellent, 5=poor). This item was then reverse coded, with higher scores associated with higher quality of diet. Self-rated dietary quality has been used in previous research (Blanck, 2009). The quality of sleep was measured with a single question: "How would you rate your sleep quality overall for the past 30 days?" This scale is designed to capture the subjective experience of sleep, sleep disruptions, difficulties in sleep (Hill et al., 2009). The response categories ranged from (1) excellent to (5) poor. This item was also reverse coded with higher scores indicating a higher quality of sleep. : Ridner, et al. (2010) used a single item to assess smoking frequency across the past 30 days to categorize participants into "current smoker" and "not a current smoker" (p. 438). We modified their approach and asked "Are you a current smoker, a former smoker, or have you never smoked?" Our focus was on the current smokers; former smokers and never smokers were combined into a single category.

3. Data Analysis

The Statistical Package for the Social Sciences (SPSS) Version 20.0 was used to analyze the STA data. Descriptive analyses (e.g., means, SD) were calculated to identify and understand the dispersion of study variables. Cronbach's alpha coefficient scores were calculated to examine the reliability of the each variable. Pearson's zero-order correlations were used to examine the relationships among health behavior variables, mental health, self-rated physical health, and demographic variables (gender and age). Hierarchical multiple regression analysis was used to examine the contribution of health behavior variables to self-rated physical health and mental health. We used a dummy variable for gender (1 = male, 0 = female). Hierarchical regression allows researchers to assign the order of entry of variables according to logical or theoretical importance (Tabachnick & Fidell, 2006). In this study, two blocks of independent variables were sequentially entered into the regression model to examine the contribution of each. Demographic variables (age and gender) were entered into the regression model in the first block. The second block comprised health behavior variables (strenuous activity, moderate exercise, and walk activity, quality of sleep, quality of diet, and smoker type). This two-block analysis was used to examine the contribution of independent variables to mental health and self-rated physical health controlling for the effects of demographic variables.

4. Results

Table 1 shows significant statistical relationships among demographic variables (i.e., gender and age), healthy behaviors, mental health, and self-rated physical health. The statistically significant relationship between mental health and quality of sleep ($r = .37$, $p < .01$) indicates

that respondents who sleep well were more likely to self-report higher levels of mental health. Mental health was also positively related to diet (r = .23, p < .01), age (r = .18, p < .01), and strenuous activity (r = .07, p < .01). On the other hand, smoking was negatively associated with mental health (r = -.18, p < .01). The correlation analyses indicate that gender, age, and health behavior variables had statistically significant relationships with mental health. Physical health was positively associated with quality of sleep (r = .32, p < .01), and quality of diet (r = .24, p < .01). In addition, strenuous activity (r = .27, p < .01) and moderate exercise (r = .16, p < .01), and walking (r = .12, p < .01) were significantly related to self-rated physical health. Among independent variables, age (r = -.16, p < .01) and smoking (r = -.11, p < .01) were negatively associated with physical health, indicating that younger respondents and non-smokers tend to report higher levels of physical health.

Table 1. Zero-order correlation coefficients of independent and dependent variables

	1	2	3	4	5	6	7	8	9
1. Gender									
2. Age	.04								
3. Walk Activity	-.02	-.05*							
4. Moderate Exercise	-.09**	-.13**	.21**						
5. Strenuous Activity	-.22**	-.25**	.21**	.28**					
6. Quality of Sleep	-.07**	.13**	.06*	.03	.07**				
7. Quality of Diet	-.05*	.23**	.08**	.09**	.15**	.37**			
8. Smoking	-.07**	-.10**	-.05*	-.01	.03	-.12**	-.13**		
9. Self-Rated Physical Health	-.04	-.16**	.12**	.16**	.27**	.32**	.24**	-.11**	
10. Mental Health	-.07**	.18**	.03	.02	.07**	.37**	.23**	-.18**	.27**

Note: **p < .01, *p < .05.

Based on the results of correlation analysis, hierarchical multiple regression analyses were conducted to assess the unique contribution of the demographic variables (step 1) and health behavior measures (step 2). In the hierarchical analysis of mental health, gender and age were entered in step 1, explaining 4% of the variance (R^2 = .042, p < .001). Gender and age were significant predictors at each step. In this model, gender (β = -.085, p <. 01) and age (β = .191, p <. 001) were significant. After the entry of health behavior variables (i.e., walking, moderate exercise, strenuous activity, quality of sleep, quality of diet, smoking) in step 2, the total variance explained by the model was 13% (see Table 2). The health behavior variables accounted for an additional 9%. The quality of sleep (β = .299, p <. 001), smoking (β = -.138, p <. 001), and strenuous activity (β = .073, p <. 01) were also significant predictors of mental health.

Table 2. Hierarchical multiple regression analysis in predicting mental health

	Mental Health					
	Step 1			Step 2		
	B	β	t	B	β	t
Demographic Variables						
Gender	-.126	-.085	-3.268**	-.077	-.052	-2.082*
Age	.008	.191	7.351***	.006	.141	5.395***
Health Behavior Variables						
Walk Activity				.000	.000	-.012
Moderate Exercise				.001	.003	.100
Strenuous Activity				.023	.073	2.665**
Quality of Sleep				.185	.299	11.451***
Quality of Diet				.034	.048	1.779
Smoking				-.256	-.138	-5.652***
F	31.337***			39.279***		
R^2	.042			.181		
R^2_{Change}	.042			.139		

Note: ***p < .001, **p < .01, *p < .05.

Table 3 shows the results of the hierarchical multiple regression analysis on physical health. Gender and age were entered as predictor variables in step 1, and health behavior variables were entered in step 2. In step 1, 3% of the variance in physical health was explained by age (β = -.165, p <. 001). When health behavior variables were entered in step 2, quality of sleep (β = .263, p <. 001), strenuous activity (β = .179, p <. 001), quality of diet (β = .145, p <. 001), smoking (β = -.089, p <. 001), and moderate exercise (β = .065, p <. 01) uniquely contributed to physical health (p < .01). Overall, 19.5% of the variance in physical health was explained in step 2. This result demonstrates that strenuous activity, quality of sleep and diet, and moderate exercise predicted physical health while smoking had a negative relationship.

Table 3. Hierarchical multiple regression analysis in predicting self-rated physical health

	Self-rated Physical Health					
	Step 1			Step 2		
	B	β	t	B	β	t
Demographic Variables						
Gender	-.092	-.041	-1.599	.062	.028	1.169
Age	-.011	-.165	-6.379***	-.012	-.190	-7.493***
Health Behavior Variables						
Walk Activity				.010	.023	.970
Moderate Exercise				.033	.065	2.622**
Strenuous Activity				,086	.179	6.786***
Quality of Sleep				.243	.263	10.430***
Quality of Diet				.151	.145	5.528***
Smoking				-.247	-.089	-3.783***
F	22.102***			52.202***		
R^2	.030			.225		
R^2_{Change}	.030			.195		

Note: ***p < .001, **p < .01.

5. Discussion

This study explored the relationship between healthy behaviors and physical and mental health. The results of this study show that quality of sleep, strenuous activity, moderate exercise, tobacco use, and age were positively associated with physical health. In addition, quality of sleep, strenuous activity, tobacco use, and demographic factors (e.g., age and gender) predicted mental health. This study indicates that healthy behaviors are influential factors in physical and mental health. It also suggests that individuals who pursue and engage in healthy behaviors are more likely to be healthy and to enjoy a sense of well-being.

According to this study, quality of sleep was the strongest predictor of self-reported physical and mental health. In general, the result of this study is consistent with previous findings that quality of sleep positively affects health (e.g., Darviri et al., 2011; Hale et al., 2013). Numerous studies also provide evidence that vigorous physical activity is related to fewer negative psychological symptoms and to increased mental health (e.g., Buman et al., 2010; Harvey et al., 2010). This study further supports that participation in vigorous physical activity contributed more to mental health as opposed to moderate intensity physical activity participation. These results suggest that vigorous physical activity reduces factors that decrease mental health. On the other hand, Kim et al. (2012) stressed the importance of moderate exercise for mental health; however, the results of this study suggested that

moderate exercise is not associated with mental health and that it may contribute only to physical health.

A growing body of literature indicates that a lack of physical activity and poor nutrition play important roles in the development of obesity (e.g., Coon et al., 2001; Troiano et al., 2000). These studies suggested that individuals who pursued sedentary activities also had poor diets. In addition, prior studies found that participating in physical activity and consuming a nutritious diet increased health and reduced the risk of chronic disease (e.g., Aldana et al., 2005; Fung et al., 2005). However, these studies mainly focused on the relationship between a nutritious diet and physical health. The result of this study expands the existing literature to demonstrate that the quality of one's diet is also positively associated with mental health.

Numerous studies have found that smoking is detrimental to physical and mental health (Bandiera, Richardson, Lee, He, & Merikangas, 2011; Degenhardt & Hall, 2001; Karban & Eliakim, 2007; Mahmud & Feely, 2003). Specifically, Vogl and colleagues (2012) examination of the relationship between smoking status and health-related quality of life found that individuals who never smoked experienced high levels of positive components such as mobility, self-care, and activity engagement compared to heavy smokers. Conversely, Funahashi et al. (2011) found that there are no differences in health-rated quality of life between non-smokers and smokers among the rural Japanese population. More precisely, smoking status was not associated with physical, social, and psychological health. Our study supported the majority of studies that smoking has negative effects on physical and mental health.

This study provides evidence that age and gender are associated with physical and mental health. Individuals who were older and female reported better mental health; younger participants reported better physical health. Our understanding of this result is that younger individuals are more likely to participate in physical activities and to use a variety of activity resources compared to older adults. However, according to Gooding, Hurst, Johnson, and Tarrier (2012), older adults had better problem-solving skills and the ability to regulate their emotions, which contributed to resilience as opposed to younger generation. Our results suggest that older adults may have greater ability to manage negative life stressors and life challenges than young adults, thus contributing to better mental health.

Despite the contributions of the study, several limitations should be noted. The use of a cross-sectional study design limits the ability to determine the relationship among variables across time. More work is needed to assure the validity and reliability of self-reported measures of diet, exercise, and smoking behaviors (Ridner, Walker, Hart, & Myers, 2010). Causal relationships among the study variables are not warranted and need further investigation.

Although hierarchical regression models of mental health and physical health can be claimed to be effective models, a significant portion of the variances (82% and 78% respectively) remained unexplained. Moreover, some inconsistencies with existing research were found. Perhaps, some potential factors of mental health and physical health were neglected in the models. Future research is needed to examine these and addition correlates of mental health

including chronic stress and strategies for its management, social support, loneliness and depression. Future research should seek to corroborate the current approach using different behavioral contexts to support the generalizability of our findings as well as to identify cultural, community and family factors that may impinge on one's decisions to exercise, smoke, and seek a healthy diet.

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