

Relationship of Physical Activity to Health

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Abstract

People who undertake moderate physical activity are at exceptionally low risk of several chronic illnesses, which include but are not limited to - Type II diabetes, some types of cancers, and cardiovascular disorders (Stanton, Happell, & Reaburn, 2014). There have been several studies investigating the relationship between physical activity and health, specifically mental health, and obesity. Several studies have shown a persistent gap that warrants further empirical inquiry. This study addressed this gap in the literature. The study found that physical health based on physical activity/exercise improves weight control and mental health as well as reduces number of days of poor health. The study recommended that medical doctors should stress to their patients that physical activity promotes good health and less dependence on medications. The study also recommended that World Health Organization and governments around the world should stress on physical activity; that, physical activity results in healthy people. The study recommended further research into how 1) regular adequate sleep, 2) well-balanced diet, 3) physical activity, 4) intermittent fasting, and 5) water hydration, each contributes to 1) good health and 2) slow down aging.

Keywords: Health, exercise, intermittent fasting, medication, World Health Organization,

Introduction

Physical activity can benefit the overall health of a person. People who undertake moderate physical activity are at exceptionally low risk of several chronic illnesses, which include but are not limited to - Type II diabetes, some types of cancers, and cardiovascular disorders (Stanton, Happell, & Reaburn, 2014). Besides, physical activity can also benefit an individual in staying healthy, controlling weight, and promote strong bone and joint development (U.S. Department of Health & Human Resources, 2017). Dyer (2020) stated that there are six factors that promote good health: 1) Regular adequate sleep, 2) well-balanced diet, 3) regular physical activity, 4) avoiding tobacco products, and 5) using alcohol in moderation or not at all. Gunnars (2016) stated health benefits of intermittent fasting: 1) good health, 2) healthy body weight, 3) good heart health, 4) may help prevent cancer, 5) good brain health, 6) prevent Alzheimer's disease, 7) lower risk of type-2 diabetes, and 8) lose belly fat. Wright (2017) stated six benefits of water hydration: 1) water promotes cardiovascular health, 2) water helps muscles and joints work better, 3) water keeps skin supple, 4) water cleanse the body, 5) water cools the body, and 6) water moist throat and lips.

There have been several studies investigating the relationship between physical activity and health, specifically mental health, and obesity. Several studies have shown a persistent gap that warrants further empirical inquiry (Dyer, 2020; Gunnars, 2016; Wright, 2017). The study addressed the gap in the literature.

The rest of the paper is structured as follows: The Literature review section synthesized existing literature. The Methodology and Results section addressed the methodology used and the results. The Discussion and Recommendations section discussed the findings of the study and made recommendations for people, medical doctors, governments, and the World Health

Organization. Finally the Conclusion section made recommendations for further research and concluded the paper.

Literature Review

Physical activity can benefit the overall health of a person. People who undertake moderate physical activity are at exceptionally low risk of several chronic illnesses, which include but are not limited to - Type II diabetes, some types of cancers, and cardiovascular disorders (Stanton, Happell, & Reaburn, 2014). In recent years, many studies have shown that being physically active can improve and boost self-esteem, mood, energy levels, and sleep quality, which would indirectly reduce the risk of stress, anxiety, and depression (Brotheridge, 2015). Besides, physical activity can also benefit an individual in staying healthy, controlling weight, and promote strong bone and joint development (U.S. Department of Health & Human Resources, 2017). Studies have shown that individuals who are physically active exhibit slower rates of age-related memory and cognitive loss than those who have a sedentary lifestyle.

According to the CDC (2017-2018), about 40% among young adults aged 20 to 39 years, 44.8% among middle-aged 40 to 59 years, and 42.8% among aged 60 and older are obese. One will experience positive health benefits and be on a better path by incorporating physical activity for at least 30 min -150 min in their life for at least five days a week. The time may vary on the type of exercise/physical activity an individual performs.

There are six types of research – descriptive, exploratory, inferential, predictive, causal, and mechanistic (Lind, Marchal, & Wathen, 2018). Descriptive analysis is used to summarize and organize the data by determining central tendency measures and variability measures. Inferential

analysis is utilized to infer results for a relatively small sample of data to say something about a more significant population.

Purpose of the Study

The purpose of the study was to address how physical health due to physical activity/exercise contributes to BMI/weight control, mental health/emotional health and days of poor health (that is, good health). In this study, physical healthy/physical activity/exercise is independent variable. BMI/weight control, mental health/emotional health and days of poor health are the dependents variables.

Methodology and Results

Methodology

According to Lind, Marchal, & Wathen (2018), a hypothesis is an assumption about a factor. The hypotheses for this study are

Hypothesis 1: There is no relationship between physical health and Basal Metabolic Index/weight.

Hypothesis 2: There is no relationship between physical health and mental health/emotional health.

Hypothesis 3: This is no relationship between physical health and days of poor health.

In this study, 35 participants were randomly selected and surveyed using SurveyMonkey for collection of responses and the analysis of the responses. Excel software was used for further data analysis. The significance level was 5% for the hypotheses test. T-test and ANOVA test were used for the hypotheses.

Results

Demographic Analysis

Table1: Gender

Gender	
Male	11
Female	24

Table 1 shows that out of the 35 participants, 11 were males and 24 were females.

Table 2 Age

Age	
20-30	12
30-40	15
40-50	3
50-60	5

Table 2 shows 15 participants were aged 30 years and 5 participants were aged 50-60.

Table 3 Education

Education		
graduated from college or technical school	20	
attended college or technical school	11	
graduated high school	3	
refused/missing	1	

Table 3 shows the majority of the participants graduated from college or technical school.

Table 4 Employment

Employment Status	
Employed	28
Student	3
Retired	1
Homemaker	3

Table 4 shows 28 the majority of the participants were employed.

Descriptive analysis

Table 5: Physical Healthy

Frequency Table for Physically Healthy		
Physical health		Frequency
Extremely healthy		4
Very healthy		11
Somewhat healthy		12
Not so healthy		6
Not at all healthy		2
	Total	35

Table 5 shows 4 (11.4%) of the participants were extremely healthy in the past 4 weeks, 11(31.4%) were very healthy, and 12 (34.2%) were somewhat healthy.

Table 6: Emotional Problems in the past 4 weeks

Frequency table for emotional problems in the past 4 weeks		
Emotional problems		Frequency
Extremely disruptive		2
Very disruptive		4
Somewhat disruptive		9
Not so disruptive		9
Not at all disruptive		11
	Total	35

Table 6 shows 9 (25%) of the participants were not so disruptive in the past 4 weeks, and 11 (31.4%) were not at all disruptive.

Table 7 BMI/Weight

Frequency table for BMI		
BMI		Frequency
underweight (BMI <18.5)		4
normal weight (BMI 18.5 - 24.9)		22
Overweight (BMI 25.0 - 29.9)		8
Obese (BMI >30.0)		1
	Total	35

Table 7 shows 22 (62.8%) of participants had normal weight within the 4 weeks, 8 (22.8%) were overweight, and 1 (2.8%) was obese.

Table 8: Days of Poor Health

Days of poor health	frequency
None	18
1-30 days	11
don't know	6

Table 8 shows 18 (51.4%) of the participants had none days of poor health within the past 4 weeks, 11 (31.4%) participants had 1-30 days of poor health.

Inferential Statistical Analysis

Hypothesis 1: There is no relationship between physical health and Basal Metabolic Index/weight.

Table 9: t-Test: Two-Sample Assuming Unequal Variances

	<i>BMI</i>	<i>Physical Health</i>
Mean	2.171428571	3.257142857
Variance	0.440336134	1.137815126
Observations	35	35
Hypothesized Mean Difference	0	
Df	57	
t Stat	-5.112993742	
P(T<=t) one-tail	1.92721E-06	
t Critical one-tail	1.672028888	
P(T<=t) two-tail	3.85441E-06	
t Critical two-tail	2.002465459	

Table 9 shows that the p-value of 0.000 is less than the significance level 0.05 (0.5%), therefore, the null hypothesis that there is no relationship between physical health and BMI/weight is rejected. Therefore, there is a relationship between physically healthy people and their normal BMI/weight.

Hypothesis 2: There is no relationship between physical health and mental health/emotional health.

Tables 10: t-Test: Two-Sample Assuming Unequal Variances

	<i>Physical Health</i>	<i>Emotional problems in past 4 weeks</i>
Mean	3.257142857	2.342857143
Variance	1.137815126	1.467226891
Observations	35	35
Hypothesized Mean Difference	0	
Df	67	
t Stat	3.351263604	
P(T<=t) one-tail	0.000662635	
t Critical one-tail	1.667916114	
P(T<=t) two-tail	0.00132527	
t Critical two-tail	1.996008354	

Table 10 shows that the p-value is less than significance level ($0.001 < 0.05$), therefore the hypothesis is rejected. Therefore, there is a relationship between physically healthy people and their emotional health.

Hypothesis 3: This is no relationship between physical health and days of poor health.

Table 11: t-Test: Two-Sample Assuming Unequal Variances

	<i>Physical Health</i>	<i>Days of poor health</i>
Mean	3.257142857	1.657142857
Variance	1.137815126	0.58487395
Observations	35	35
Hypothesized Mean Difference	0	
Df	62	
t Stat	7.211914262	
P(T<=t) one-tail	4.61682E-10	
t Critical one-tail	1.669804163	
P(T<=t) two-tail	9.23364E-10	
t Critical two-tail	1.998971517	

Table 11 shows that the p-value of 0.00 which is less than the 0.05 (05%) significance level, therefore, the hypothesis that there is no relationship between physical health and days of poor health. Instead, there is a relationship between physically healthy people and their days of poor health.

ANOVA

Table 12 Regression and AVOVA: Physical heath vs BMI/weight

<i>Regression Statistics</i>		
Multiple R		0.230317403
R Square		0.053046106
Adjusted R Square		0.024350533
Standard Error		1.053616971
Observations		35

ANOVA

	df	SS	MS	F	Significance F
Regression	1	2.052126499	2.052126499	1.84858155	0.183166686
Residual	33	36.63358779	1.110108721		
Total	34	38.68571429			

Table 12 shows in the Regression Statistics table, the R Square of 0.053046106, that is, 5.3% of normal BMI/weight is contributed by physical health/physical activity/exercise. Also in the ANOVA table, the F of 1.84858155 is greater than the significance F of 0.183166686. Therefore, we reject the hypothesis, and instead conclude that physically healthy/physical activity/exercise contributes to normal BMI/weight.

Table 13 Regression and ANOVA: Physical health vs emotional health

<i>Regression Statistics</i>					
Multiple R					0.525508698
R Square					0.276159392
Adjusted R Square					0.254224828
Standard Error					0.921170056
Observations					35

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	10.68342333	10.68342333	12.5901474	0.001187901
Residual	33	28.00229095	0.848554271		
Total	34	38.68571429			

Table 13 shows that in the Regression Statistics table, the R Square of 0.276159392, that is, 27.6% of emotional health is contributed by physical health/physical activity/exercise. In the ANOVA table, the F of 12.5901474 is greater than the significance F of 0.001187901. Therefore, we reject the hypothesis, and instead conclude that physically healthy /physical activity/exercise contributes to improvement in emotional health.

Table 14: Regression and ANOVA: Physical health vs days of poor health

<i>Regression Statistics</i>					
Multiple R					0.681936659
R Square					0.465037607
Adjusted R Square					0.448826625
Standard Error					0.791917548
Observations					35

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	17.99031199	17.99031199	28.6865791	6.45169E-06
Residual	33	20.6954023	0.627133403		
Total	34	38.68571429			

Table 14 shows that in the Regression Statistics table, R Square of 0.465, that is, 46.5% of fewer days of poor health is contributed by physical health/physical activity/exercise. In the ANOVA table, the F of 28.6865791 is greater than the significance F of 6.45169E-06. Therefore, we reject hypothesis, and instead conclude that physically healthy/physical health/exercise contributes to fewer days of poor health.

That Regression R Squared results and the ANOVA results show that there are other factors apart from physical activity/exercise that contribute to good health. This is confirmed by other researchers. For good health, Dyer (2020) recommended regular adequate Sleep, 2) well-balanced diet, 3) regular physical activity, 4) healthy body weight, 5) avoiding tobacco products, and 6) avoiding alcohol. Gunnars (2016) recommended intermittent fasting, and Wright (2017) recommended water hydration.

Discussion and Recommendations

. Of the 35 participants, 11.4% were extremely healthy, 31.4% were very healthy, and 34.2% were somewhat healthy. Also 62.8% of 35 participants had normal weight, 22.8% were overweight, and 2.8% was obese. Of the 35 participants, 25% were not so disruptive in the past 4 weeks, and 31.4% were not at all disruptive. Physical health based on physical activity/exercise improves weight control and mental health as well as reduces number of days of poor health, that is, improves good health. However, there may be other factors apart from physical activity/exercise that may further improve weigh control, mental health and good health (that is, reduces number of days of poor health).

The study recommended that medical doctors should stress to their patients that physical activity promotes good health and less dependence on medications. The study also recommended that World Health Organization and governments around the world should stress on physical activity; that, physical activity results in healthy people.

Conclusion

Physical activity can benefit the overall health of a person. People who undertake moderate physical activity are at exceptionally low risk of several chronic illnesses, which include but are not limited to - Type II diabetes, some types of cancers, and cardiovascular disorders. This study found that physical health due to physical activity/exercise improves normal BMI/weight, reduces mental emotional problems, and fewer days of poor health. The study found that apart from physical activity, other factors also contribute to good health.

The study recommended further research into how 1) regular adequate sleep, 2) well-balanced diet, 3) physical activity, 4) intermittent fasting, 5) water hydration, 6) avoiding tobacco products, and 7) avoiding alcohol each contributes to less dependence on medications. The study recommended further research into how 1) regular adequate sleep, 2) well-balanced diet, 3) physical activity, 4) intermittent fasting, 5) water hydration, 6) avoiding tobacco products, and 7) avoiding alcohol each contributes to slow down aging. The study recommended further research into how 1) regular adequate sleep, 2) well-balanced diet, 3) physical activity, 4) intermittent fasting, 5) water hydration, 6) avoiding tobacco products, and 7) avoiding alcohol each contributes to reduce Type II diabetes, some types of cancers, and cardiovascular disorders. The study recommended further research into how 1) regular adequate sleep, 2) well-balanced diet, 3) physical activity, 4) intermittent fasting, and 5) water hydration each contributes to good health.

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