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COMPREHENSIVE ANALYSES OF THE CORRELATIONS BETWEEN MODERATE/ACTIVE EXERCISES SUCH AS SLOW WALKING, SLOW JOGGING, RUNNING, BICYCLING, AND SWIMMING AND OBSTRUCTION SLEEP

"APNEA (OSA) APHYPI 2"

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ABSTRACT

This study examined the comprehensive correlations between scheduled slow or mild exercises such as walking and jogging and** Obstructive Sleep Apnea (OSA) or **Aphypi is** normally measured with Apnea Hypopnea Index (AHI)**. Thisanalyzed 302 participants using genders and ages as the "Independent Potential Confounders Variables" in its data analyses.The study used "Social Construction of the Ideology of Realty Theory" as a lens of analysis. The study found that when it comes to genders' differences between gender and OSA's Aphypi wellbeing overall effects, there were no statistically significant indifferences between males and females or children in their overall health wellbeing outcomes.Also, the study found no statistically significant differences between age groups as well; because older males or females were able to equally perform effectively as younger boys and girls based on the collected and analyzed dataset statistics.The study also found that the multiple combinations of at least 2 or more exercises' methods yielded positive correlations. However, conversely to the above findings and results, the study found that there were profound significant statistical differences between slow or mild walking, slow or mild jogging, active jogging, active running, active jogging, active walking, active bicycling, active swimming and OSA's Aphypi overall health wellbeing outcomes at 100% and 96% positive effectiveness correlations against OSA's Aphypi based on the above scheduled weeks and times of exercises. The study recommends that its' results and findings be implemented comprehensively as to eventually bring some POSITIVE SOCIAL CHANGES to all its participants and beyond.

KEYWORDS**:Obstructive Sleep Apnea (OSA), **Aphypi, Independent Potential Confounders Variables, Sleep Disorder, obstructive sleep apnea syndrome (OSAS), Obstructive sleep apnea–hypopnea syndrome (OSAHS), Airway Interruptions, Air Flow, Breathing Disorders, Endless Sleeps, Short Sleeps, Neck Circumference 1, Neck Circumference 2, Body Mass Index (BMI), Age, Gender, Walking, Jogging, Running, Bicycling, & Swimming

INTRODUCTION

According to most recent information obtain about this follow-up and finale of this **Obstructive sleep apnea** (**OSA**) research study,

Obstructive sleep apnea (**OSA**) is the most common sleep-related breathing disorder and is characterized by recurrent episodes of complete or partial obstruction of the upper airway leading to reduced or absent breathing during sleep. These episodes are termed "apneas" with complete or near-complete cessation of breathing, or "hypopneas" when the reduction in breathing is partial. In either case, a fall in blood oxygen saturation, a disruption in sleep, or both may result. A high frequency of apneas or hypopneas during sleep may interfere with restorative sleep, which – in combination with disturbances in blood oxygenation – is thought to contribute to negative consequences to health and quality of life.[1] The terms **obstructive sleep apnea syndrome** (**OSAS**) or **obstructive sleep apnea–hypopnea syndrome** (**OSAHS**) may be used to refer to OSA when it is associated with symptoms during the daytime (e.g. excessive daytime sleepiness, decreased cognitive function). (See American Academy of Sleep Medicine, 2014; American Academy of Sleep Medicine, 2019; Barnes, 2009; Berry et al., 2012 for more)

Based on the most recent dataset statistics obtained from confidential centralized database about OSA, several factors lead to OSA in adults and children across the board alike. For example, many have argued that age has no positive or negative corrections when dealing with OSA. This simply means that OSA can occur in your adolescents as well as in older people equally so long as the derivatives associated with compounding it (OSA) is available regardless of age. Further arguments stipulated that gender also has no correlations between OSA's occurrences and its intensities. However, many physicians have recommended that moderate exercises such as walking and slow jogging regular weekly can alleviate OSA in a short time; so long if these recommended exercises are consistent. The question now becomes does moderate exercises such as slow walking and slow jogging have any correlations with OSA's outcomes. That was the primary focus of this quantitative research study (Kisavi-Atatah, Atatah, & Kyle, p. 8, 2023 for more information).

LITERATURE REVIEWED

The literature reviewed in this follow-up comprehensive research finale study remained the same (see Kisavi-Atatah, Atatah, & Kyle, p. 8, 2023 for more information).

For a long time OSA have been overlooked by healthcare practitioners as a medical disorder until 1990 when it was identified as a severe medical sleeping disorder which can lead to death due to lack of sufficient oxygen circulating in the body. OSA appears to be more complicated than many healthcare practitioners anticipated because;

The fundamental cause of OSA is a blocked upper airway, usually behind the tongue and epiglottis, whereby the otherwise patent airway, in an erect and awake patient, collapses when the patient is lying on his or her back and loses muscle tone upon entering deep sleep.

At the beginning of sleep, a patient is in light sleep and there is no tone loss of throat muscles. Airflow is laminar and soundless. As the upper airway collapse progresses, the obstruction becomes increasingly apparent by the initiation of noisy breathing as air turbulence increases, followed by gradually louder snoring as a Venturi effect forms through the ever-narrowing air passage.

The patient's blood-oxygen saturation gradually falls until cessation of sleep noises, signifying total airway obstruction of airflow, which may last for several minutes. Eventually, the patient must at least partially awaken from deep sleep into light sleep, automatically regaining general muscle tone. This switch from deep to light to deep sleep can be recorded using ECT monitors. In light sleep, muscle tone is near normal, the airway spontaneously opens, normal noiseless breathing resumes and blood-oxygen saturation rises. Eventually, the patient reenters deep sleep, upper airway tone is again lost, the patient enters the various levels of noisy breathing, and the airway blockage returns.

The cycle of muscle-tone loss and restoration coinciding with periods of deep and light sleep repeats throughout the patient's period of sleep. The number of apnoea and hypopnoea episodes during any given hour is counted and given a score. If a patient has an average of five or more episodes per hour, mild OSA may be confirmed. An average of 30 or more episodes per hour indicates severe OSA. (See Brockmannet al., 2012; Bourkeet al., 2011; Caporaleet al., 2020; Di Mauro et al., 2020; Giordaniet al., 2012; Golanet al., 2004; Ezzeddiniet al., 2012; Landauet al., 2011; Mbataet al., 2012 for more)

What was fundamental about OSA was/is majority of people who suffered from OSA were/are obsessed and overweight which contributed to the intensity of OSA daily. Beside the above, other factors also contribute to OSA such as excessive drinking, lack of exercise, anxiety disorder, assumptions, and fears of the unknown, neck positioning issues, fatty fats in the airway system, dysfunctional respiratory system, and many others just to mention a few (see Meghanadh, 2022; Mitchell& Kelly, 2006; Punjabiet al., 2009; Stoohset al., 2005; Weiet al., 2007; Weiet al., 2009; Younget al., 2004 for more). Due to the complex definitions and classifications associated with OSA, limited historic data was used in this medical research study to stay on track and focus. The question now becomes does moderate exercises such as slow walking and slow jogging have any correlations with OSA's outcomes. That was the primary focus of this quantitative research study(see Kisavi-Atatah, Atatah, & Kyle, p. 9, 2023 for more information).

MOTHODOLOGY

The methodology selected in this follow-up comprehensive research finale study remained the same (see Kisavi-Atatah, Atatah, & Kyle, p. 9, 2023 for more information).

This study used Quantitative Research Study using **Non-Experimental Research Descriptive Statistics** as a way to calculate the differences between dependable and independent variables (see Frankfort-Nachmias, &Nachmias, (2000; 2008); Creswell, 2009; Dodgson, 1993 for more).

THEORETICAL FRAMEWORK

The theoretical framework selected in this follow-up comprehensive research finale study remained the same (see Kisavi-Atatah, Atatah, & Kyle, p. 9, 2023 for more information).

In addition to the above-mentioned theories, this quantitative research study added "**Social Construction of the Ideology of Reality Theory**"; which pinpoints the reasons why public policies and health policies decisions' make any valuable decisions during the times of such as crisis hurricanes or fail to make any decisions based on their assumptions against their actual realities' theory of outcomes (see Berger & Luckmann, 1966; Casalini et al., 2016; for more). This theory was selected for several reasons; first, the majority of healthcare practitioners suggest that exercise and weight control often lead to better health and wellbeing. Perhaps that may be possible why moderate exercises may be selected for the control of OSA; above all based on individual approaches, many patients will select moderate exercises over intense and hardcore exercises which are relatively harder to achieve one time. That was why Social Construction of the Ideology of Reality Theory was selected for this healthcare research study because it is all about healthcare practitioners and individualized based decisions making processes(see Kisavi-Atatah, Atatah, & Kyle, p. 9, 2023 for more information).

RESEARCH STUDY DESIGN

Logistic Ordinal Regression Analysis

Data Collection and Classification

This study classified the variables and was analyzed to **answer research questions 1 and 2** in the following way below.

Independent Variables for Research Question 1

RQ-1. What are the correlations between moderate exercises such as slow walking, slow jogging, running, bicycling, and swimming with OSA and BMI outcomes?

Cardiovascular Exercise (Independent variable) for Research Question 1

1. Walking
2. Jogging
3. Running
4. Bicycling

5. Swimming

Dependent Variables Research Question 1

1. Obstructive Sleep Apnea (OSA) classified Aphypi
2. Body Mass Index

Independent Potential Confounders Variables for (Research Question 2)

RQ-2. What are the correlations between age and gender with OSA and BMI outcomes?

1. Age
2. Gender

Dependent Variable for (Question 1 & 2)

1. Obstructive sleep apnea (OSA) classified Aphypi
2. Body Mass Index

Other unanalyzed Potential Confounders in this research study to be addressed in future follow-up studies were;

1. Race
2. Ethnicity
3. Race
4. Neck Circumference 1
5. Neck Circumference 2

Dependent Variables for Research Question 2

1. The severity of **Obstructive Sleep Apnea (OSA)** is normally measured with **Apnea Hypopnea Index (AHI).** This AHI used to classify OSA goes this way: mild (5- 15) events per hour, Moderate (15-30) events per hour, Severe (30->) events per hour.

Supplementary Research Question 3

RQ 3. There are correlations/relationships between 2 combinations of exercises methods with OSA and BMI outcomes.

Independent Variables for Supplementary Research Question 3

1. Minimum of 2 combinations of exercises methods e.g., jogging and swimming etc.

Dependent Variables for Supplementary Research Question 3

1. Obstructive sleep apnea (OSA) classified Aphypi
2. Body Mass Index

Note that this study only analyzed **Severe (30->) events per hour** due to possible overwhelming generation of unneeded tables and figures in this study.

The collected secondary data from the national datasets were cleaned up to prevent repeated inconsistencies and fed into Statistical Package for Social Sciences (SPSS) Version 27 and Confidence Interval of the Differences' level was set at 0.05 or 95% for data statistical differences' accuracy.

RESULTS AND FINDINGS OF THE STUDY

Table 1. Interception of likelihood

Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	2835.625			
Final	.000	2835.625	272	.000

Link function: Logit.

Table 1: Showed that the point of relationship interception was at 2836, the Sig was .000 or < 95%, and the degree of freedom (df) was 272 (see table 1 as shown above).

Table 2. Goodness of Fit

Goodness-of-Fit

	Chi-Square	df	Sig.
Pearson	5021.049	52224	1.000
Deviance	1353.730	52224	1.000

Link function: Logit.

Table 2: Showed the logistic linked function of **goodness of fit at 1.000 in Pearson as well as in Deviance as shown above.**

Table 3. Pseudo R-Square

Pseudo R-Square

Cox and Snell	1.000
Nagelkerke	1.000
McFadden	.999

Link function: Logit.

Table 3: Showed the logistic of linked function at 1.000 and .999 as shown above.

Figure 1. Relationship between Age and Aphypi

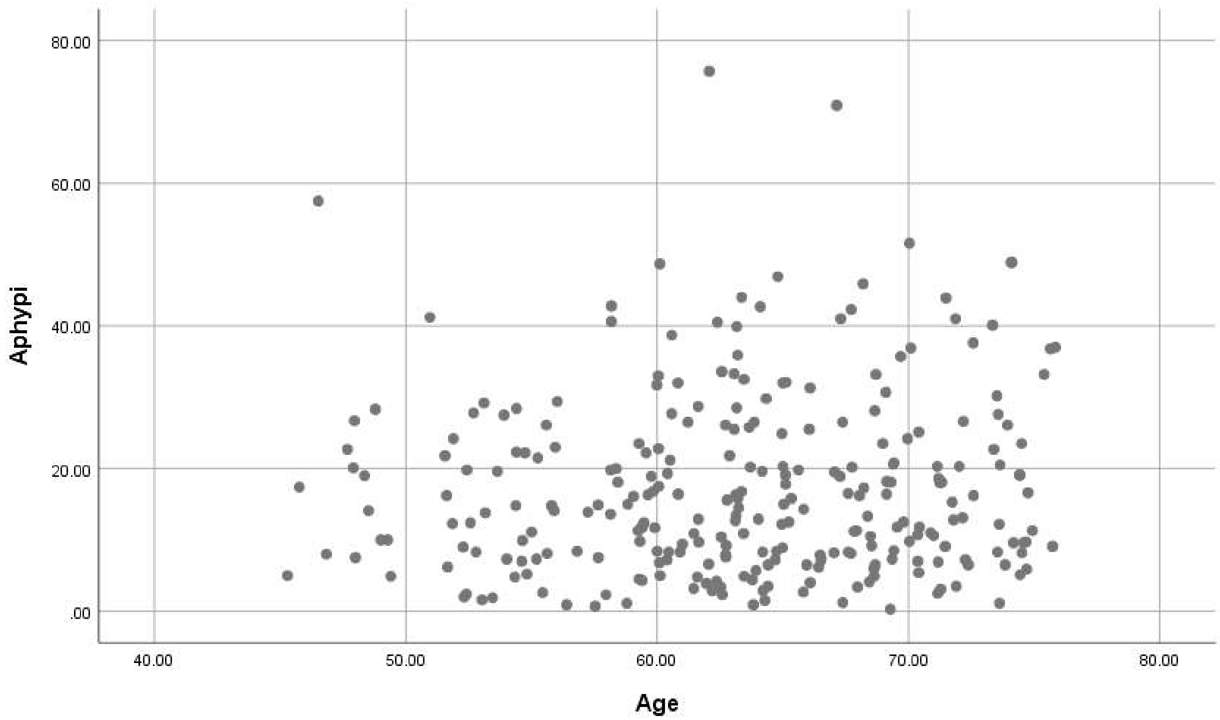


Figure 1: Showed a scattered dotted data distribution in relationship in age and Aphypi as shown above as the majority of the data were aligned above .00 vertically and horizontally; and approximately 60% of the data aligned between in between 60 and 77 years of age.

Figure 2. Relationship between Gender and Aphypi

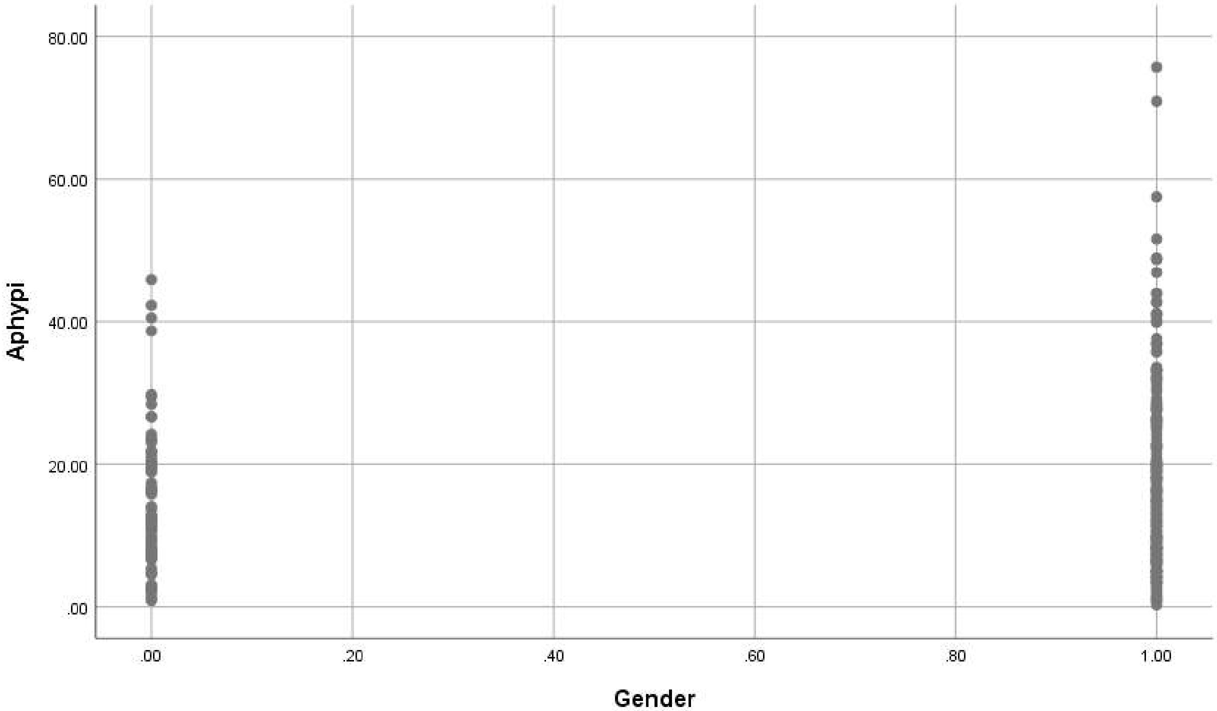


Figure 2: Showed a scattered dotted data distribution in relationship in gender and Aphypi as shown above as the majority of the data were aligned above .00 and up to approximately 43% at the lower end and approximately 88% in the upper end.

Table 4. T-Test

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Gender	302	.7384	.44023	.02533
Age	301	63.2450	7.30173	.42086
Aphypi	275	17.2753	12.72855	.76756

Table 4:Showed the T-Test mean of .7384 for gender, 63.25 for age and 17.28 for Aphypi as shown above.

Table 5. Probability Plot or P-Plot

PPlot

Model Description

Model Name		MOD_1
Series or Sequence	1	Gender
	2	Age
	3	Aphypi
Transformation		None
Non-Seasonal Differencing		0
Seasonal Differencing		0
Length of Seasonal Period		No periodicity
Standardization		Not applied
Distribution	Type	Normal
	Location	estimated
	Scale	estimated
Fractional Rank Estimation Method		Blom's
Rank Assigned to Ties		Mean rank of tied values

Applying the model specifications from MOD_1

Table 5: Showed the probability model plot between age, gender, and Aphypi as indicated above.

Table 6. Case Processing Summary

Case Processing Summary

		Gender	Age	Aphypi
Series or Sequence Length		302	302	302
Number of Missing Values in the Plot	User-Missing	0	0	0
	System-Missing	0	1	27

The cases are unweighted.

Table 6: Showed the valid case processing summary with 1 missing data in age.

Figure 3. Normal P-P Plot for Gender

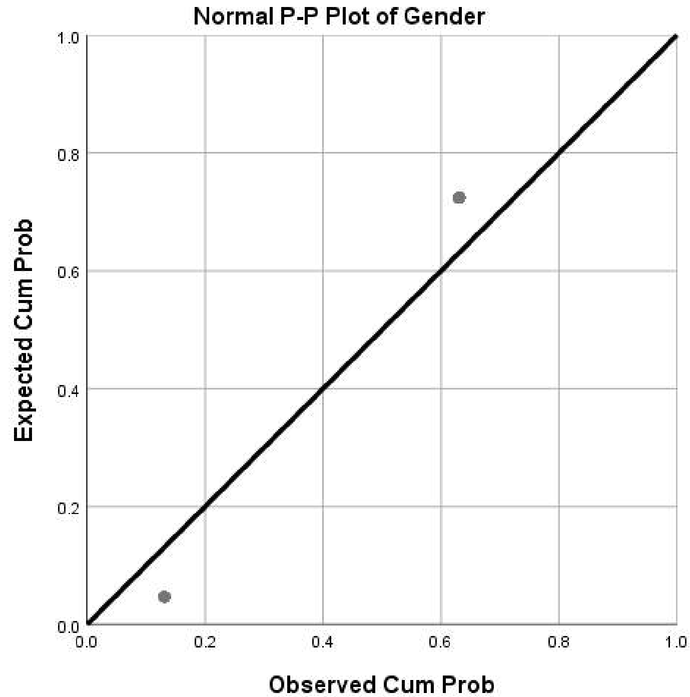


Figure 3:Showed the normal plot distribution expected cumulative probability (CP) frequency versus observed (CP) of gender data as shown above

Figure 4. Detrended Normal P-P Plot of Gender

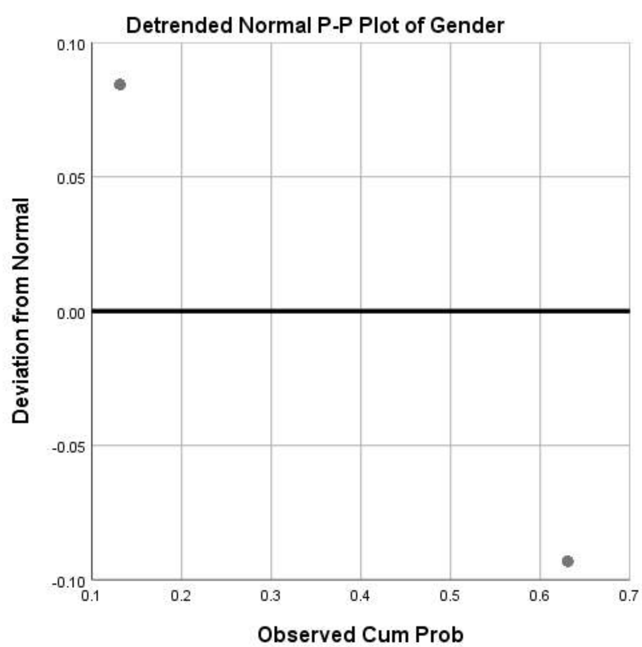


Figure 4: Showed the deviation from normal distribution and the observed cumulative probability distribution (see figure 4 above).

Figure 5. Normal P-P Plot of Age

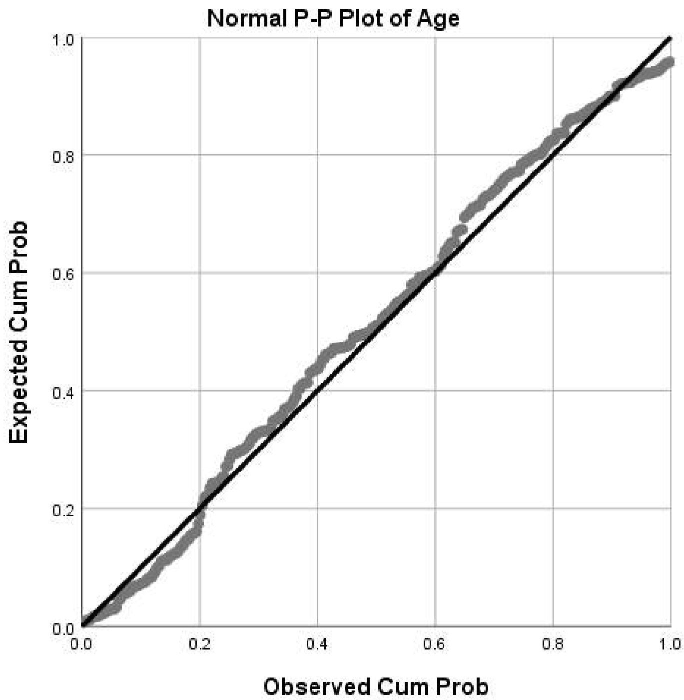


Figure 5: Showed the above compared the expected cumulative probability (CP) data distribution to the observed cumulative probability (CP) of age.

Figure 6. Detrended Normal P-P Plot of Age

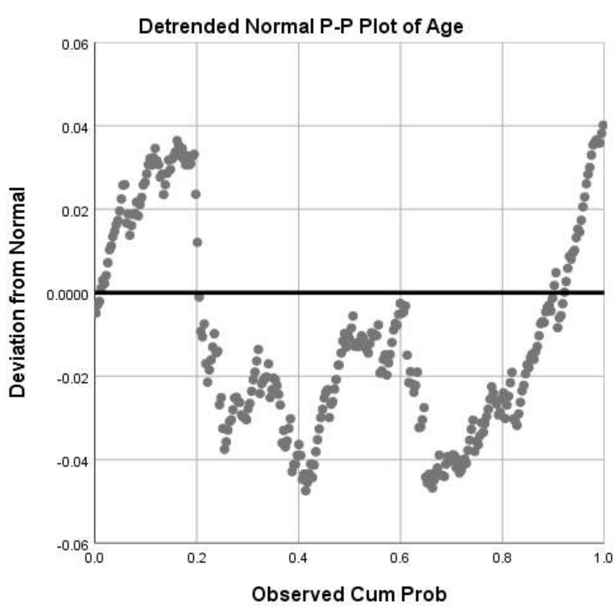


Figure 6: Showed the deviation from normal distribution versus the observed cumulative probability (CP) data distribution of age as shown above.

Figure 7. Normal P-P Plot of Aphypi

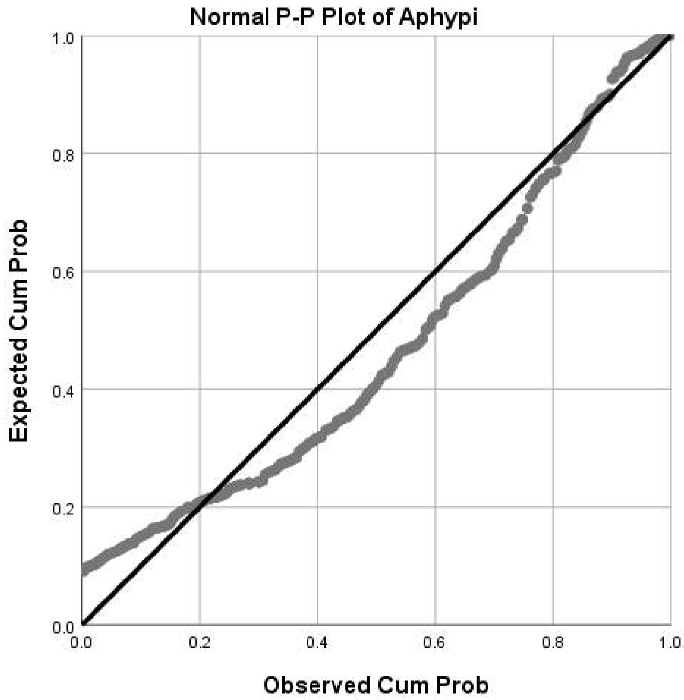


Figure 7: Showed the compared expected cumulative probability (CP) versus observed cumulative probability (CP) of age against Aphypi.

Figure 8. Detrended Normal P-P Plot Aphypi

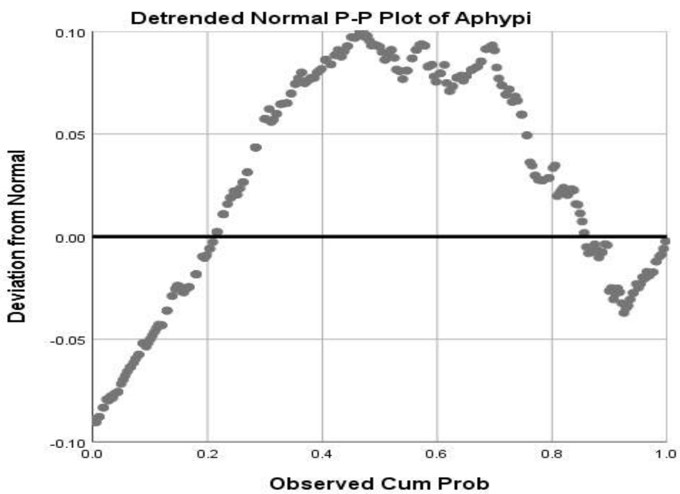


Figure 8: Showed compared the deviation from normal data distribution against observed data cumulative probability (CP) of age versus Aphypi.

Table 7. Model Fitting Information

Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	1107.501			
Final	1096.778	10.723	16	.826

Link function: Logit.

Table 7: Showed the model fitting information of logit's function with sig of .826 as shown above.

Table 8. Goodness-of-Fit

Goodness-of-Fit

	Chi-Square	df	Sig.
Pearson	3190.700	3422	.998
Deviance	658.174	3422	1.000

Link function: Logit.

Table 8: Showed the goodness of fit with Pearson sig of .998 and the deviation of 1.000 as shown above.

Table 9. Pseudo R-Square

Pseudo R-Square

Cox and Snell	.039
Nagelkerke	.039
McFadden	.004

Link function: Logit.

Table 9: Showed sig of .039, .039 and .004 as shown above.

Table 10. T-Test One-Sample Statistics

T-Test

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Active walking In Minutes Per Week	298	10.5235	14.18378	.82164
Active jogging In Minutes Per Week	298	.7081	4.17690	.24196
Aphypi	275	17.2753	12.72855	.76756

Table 10: Showed one sample T-Test with mean of 10.5 for active walking, .71 for active jogging and 17.3 for Aphypi with standard deviation of 12.73.

Table 11. One-Sample Test

One-Sample Test

	Test Value = 0					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Active walking In Minutes Per Week	12.808	297	.000	10.52349	8.9065	12.1405
Active jogging In Minutes Per Week	2.926	297	.004	.70805	.2319	1.1842
Aphypi	22.507	274	.000	17.27527	15.7642	18.7863

Table 11: Showed the confidence internal interval of the differences between the data statistics with .000 or 100% for active walking, .004 or 96% for active jogging, and .000 or 100% for Aphypi correlations.

Figure 9. ActiveJogging in Minutes per Week versus Aphypi

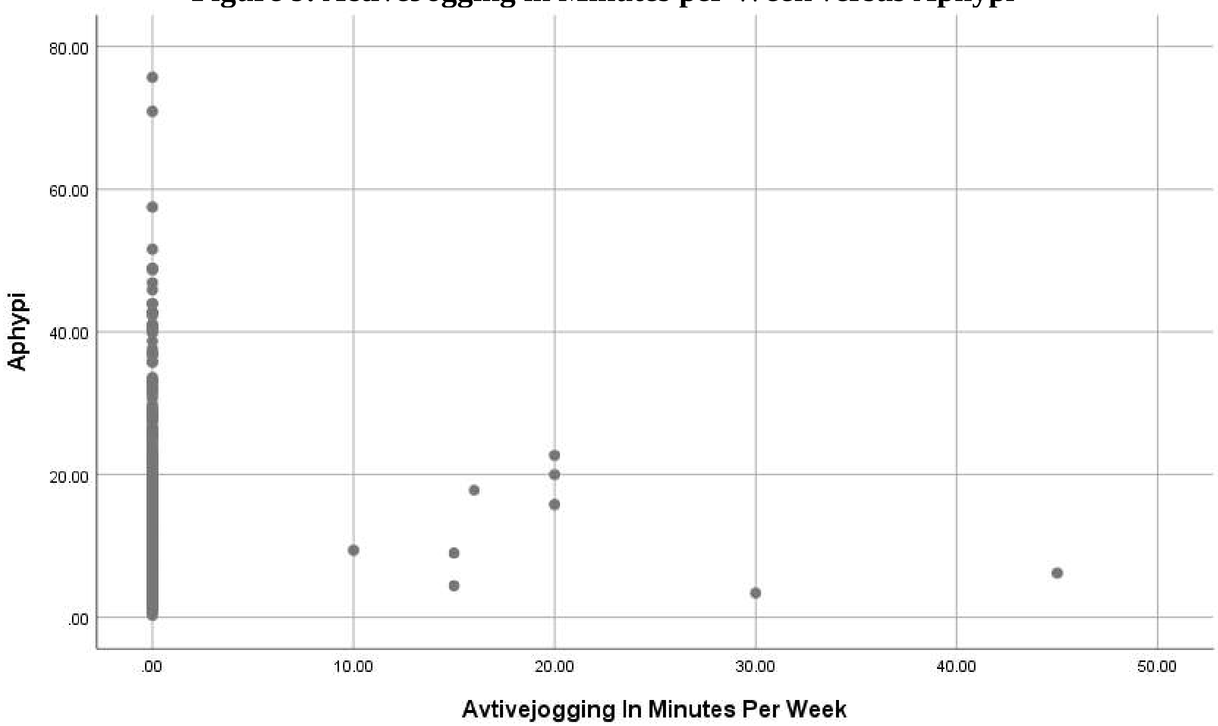


Figure 9 compared active jogging in minutes per week versus Aphypi effects' distribution as shown above.

Figure 10. Normal P-P Plot of Active Walking In Minutes per Week versus Observed Cum Probability

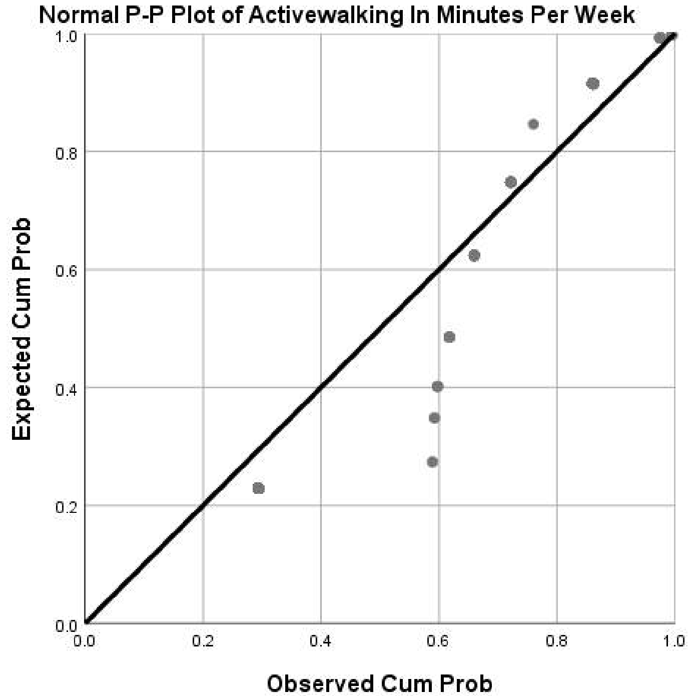


Figure 10 showed approximately 40% of data fell below the threshold while 60% were above the observed threshold.

Figure 11. Detrended Normal P-P Plot of Active Walking in Minutes per Week versus Observed Cum Probability

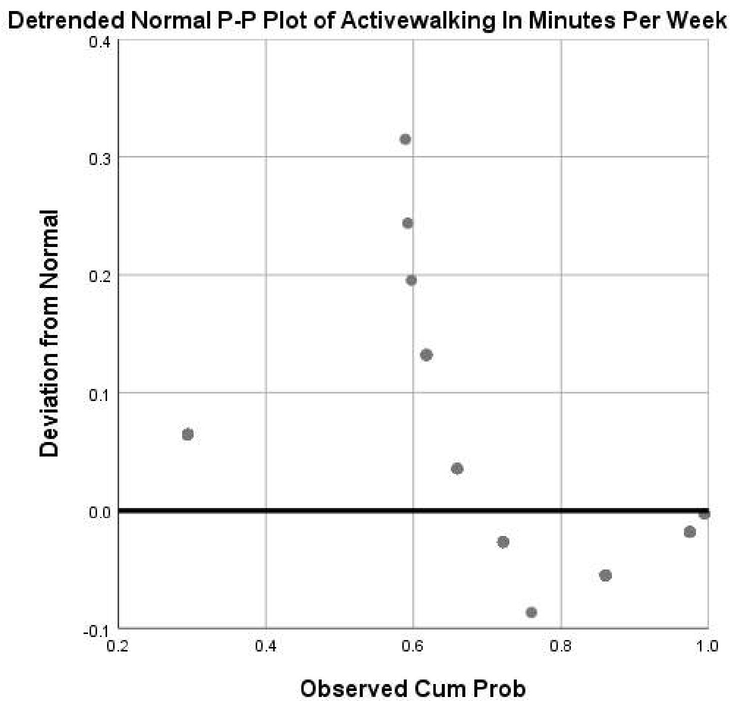


Figure 11 showed approximately 40% of data fell below the threshold while 60% were above the observed threshold.

Figure 12.Normal P-P Plot of Active Jogging In Minutes per Week Expected versus Observed Cum Probability

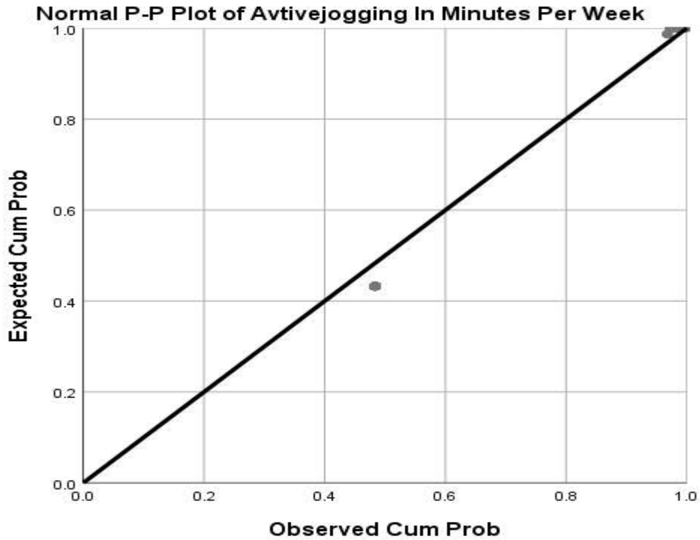


Figure 12showed approximately 20% of data fell below the threshold while 80% were above the observed threshold.

Figure 13. Detrended Normal P-P Plot of Active Jogging in Minutes per Week versus Observed Cum Probability

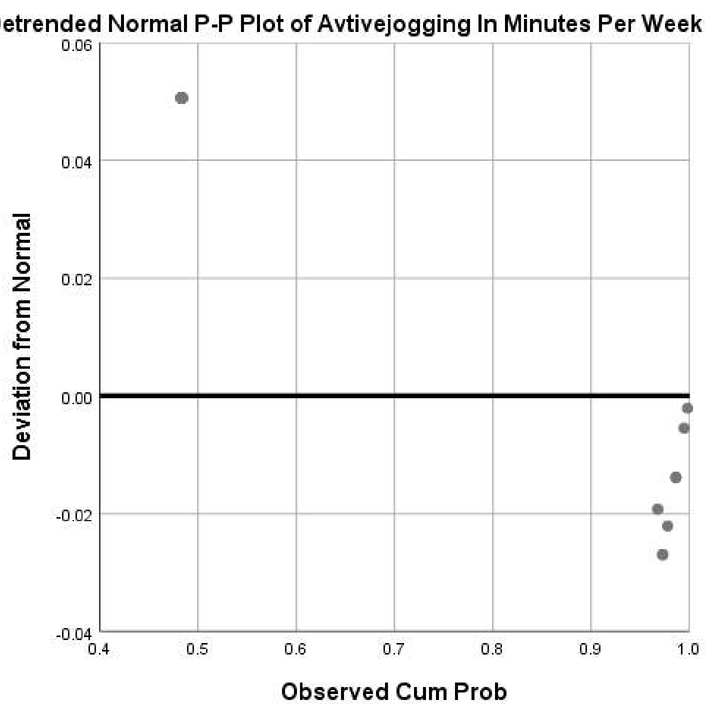


Figure 13 showed approximately 86% fell below the deviation threshold in the observed cumulative probability distribution of data.

Figure 14. Normal P-P Plot of Aphypi

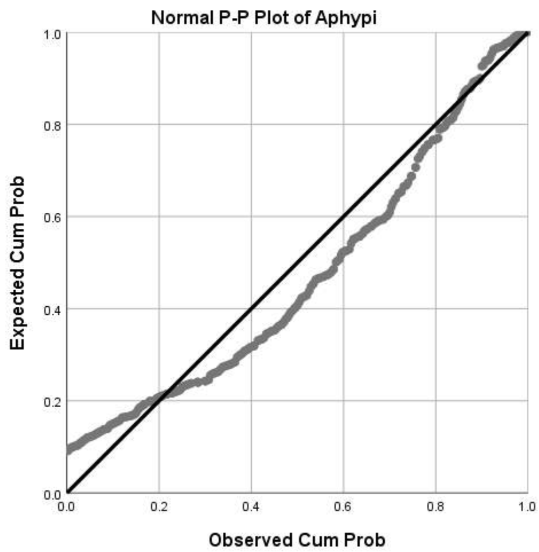


Figure 14: Showed the compared expected cumulative probability (CP) versus observed cumulative probability (CP) of age against Aphypi.

Figure 15. Detrended Normal P-P Plot of Aphypi Distribution

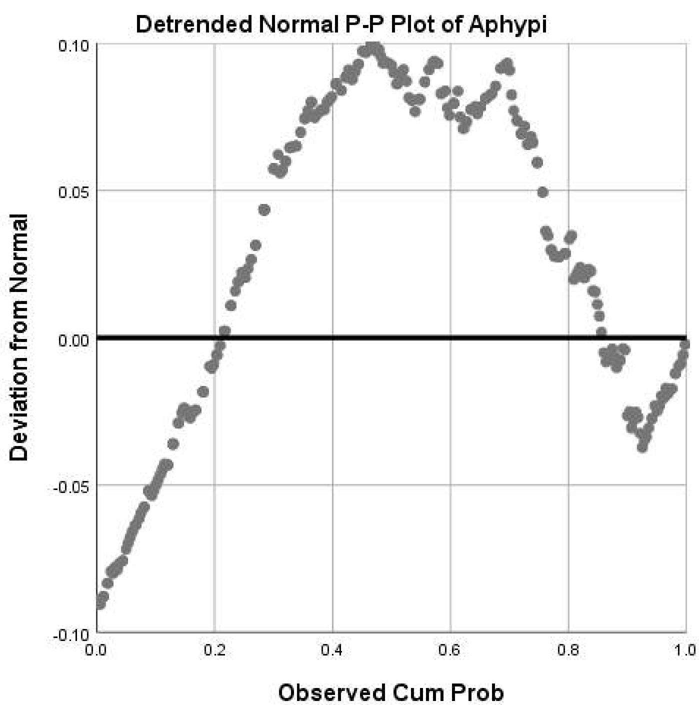


Figure 15 showed approximately 60% were above the threshold while 40% fell below the threshold.

Table 12. Model Fitting Information

Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	33.933			
Final	2.182	31.751	316	1.000

Link function: Logit.

Table 13 showed the model fitting information with initial intercept point of 33.9 and the final intercept point of 2.2 and the sig of 1.00.

Table 14. Goodness-of Fit

Goodness-of-Fit

	Chi-Square	df	Sig.
Pearson	.000	0	.
Deviance	.000	0	.

Link function: Logit.

Table 17 showed the Pearson of .000 and df of 0 (see that 23 as shown above.

Table 15. Pseudo R-Square

Pseudo R-Square

Cox and Snell	.095
Nagelkerke	.939
McFadden	.936

Table 18: Showed sig of .095, .94 and .94 as shown above.

Table 16. T-Test One-Sample Statistics

T-Test

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
BMI_Kilogram	319	34.3526	6.38106	.35727
Ethnicity	319	1.9906	.09667	.00541
Aphypi	317	26.3458	8.84438	.49675
Gender	319	.7367	.44113	.02470
NeckCM1	319	42.1829	3.74417	.20963
NeckCM2	319	42.1542	3.79500	.21248
Race	317	1.2618	.56048	.03148

Table 16 showed T-Test One-Sample Statistics with the mean of 34.35 for BMI, 1.99 for ethnicity, .737 for gender and 1.26 for race with 2 missing numbers for race as well.

Table 17. One-Sample Test

One-Sample Test

	Test Value = 0					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
BMI_Kilogram	96.153	318	.000	34.35265	33.6497	35.0556
Ethnicity	367.776	318	.000	1.99060	1.9799	2.0012
Aphypi	53.036	316	.000	26.34580	25.3684	27.3232
Gender	29.827	318	.000	.73668	.6881	.7853
NeckCM1	201.222	318	.000	42.18292	41.7705	42.5954
NeckCM2	198.392	318	.000	42.15423	41.7362	42.5723
Race	40.084	316	.000	1.26183	1.1999	1.3238

Table 17 showed the One-Sample Test with 2 missing numbers for Aphypi and race for 316 instead of 318; the lower confidence interval of the difference was 33.35 for BMI, 1,99 for ethnicity, 25.37 for Aphypi, .737 for gender, 41.77 and 41.74 for NeckCMI and NeckCM2. All data show .000 sig which indicated that there were no significant differences.

Table 18. P-Plot Model Description

P-Plot

Model Description

Model Name		MOD_5
Series or Sequence	1	BMI-Kilogram
	2	Ethnicity
	3	Aphypi
	4	NeckCM1
	5	NeckCM2
	6	Gender
	7	Race
Transformation		None
Non-Seasonal Differencing		0
Seasonal Differencing		0
Length of Seasonal Period		No periodicity
Standardization		Not applied
Distribution	Type	Normal
	Location	estimated
	Scale	estimated
Fractional Rank Estimation Method		Blom's
Rank Assigned to Ties		Mean rank of tied values

Applying the model specifications from MOD_5

Table 18 above showed P-Plot Description of the 7 data with Non-Seasonal Differencing of 0 and Seasonal Differencing of .0 as well.

Table 19. Case Processing Summary

Case Processing Summary

		BMI_Kilogram	Ethnicity	Aphypi	NeckCM1	NeckCM2	Gender	Race
Series or Sequence Length		319	319	319	319	319	319	319
Number of Missing Values in the Plot	User-Missing	0	0	0	0	0	0	0
	System-Missing	0	0	2	0	0	0	2

The cases are unweighted.

Table 19 above accounted for the missing data with 2 for Aphypi as previously indicated above.

Table 20. Estimate Distribution Parameters

Estimated Distribution Parameters

		BMI_Kilogram	Ethnicity	Aphypi	NeckCM1	NeckCM2	Gender	Race
Normal Distribution	Location	34.3526	1.9906	26.3458	42.1829	42.1542	.7367	1.2618
	Scale	6.38106	.09667	8.84438	3.74417	3.79500	.44113	.56048

The cases are unweighted.

Table 20 above showed the Estimate Distribution Parameter of normal distribution location and scale at 34.35 and 6.38 for BMI, 26.34 and 8.84 for Aphypi, identical for NeckCM1 and NeckCM2, and .737 and .441

Figure 16. Normal P-P Plot of BMI_Kilogram

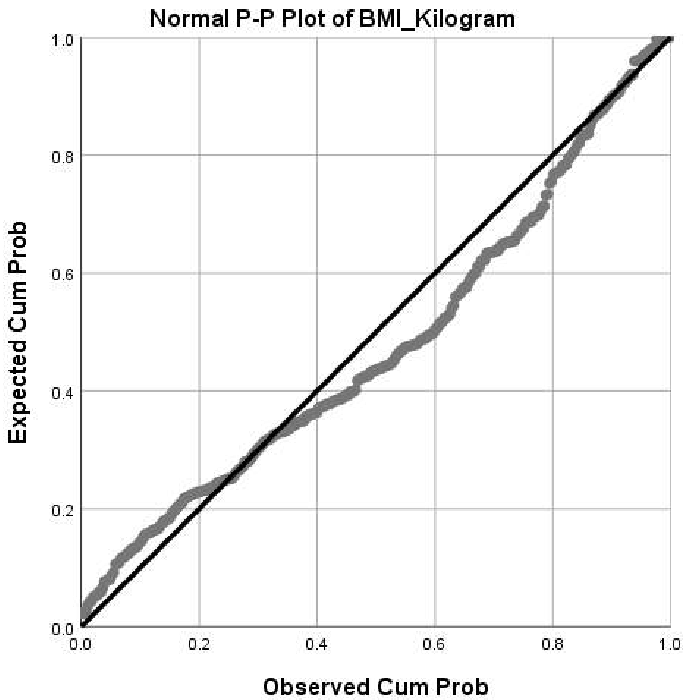


Figure 16 showed the Normal P-P Plot of BMI Kilogram for expected CP versus observed CP as shown above.

Figure 17. Detrended Normal P-P Plot of BMI Kilogram

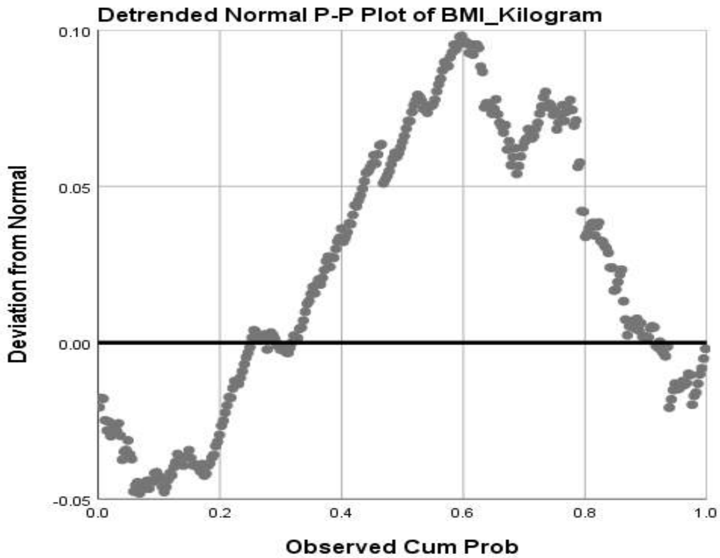


Figure 17 showed the detrended normal P-P Plot of BMIKilogram with almost 65% of the analyzed data distribution above the deviation from normal and observed CP (see figure 17 above).

Figure18. Normal P-P Plot of Ethnicity

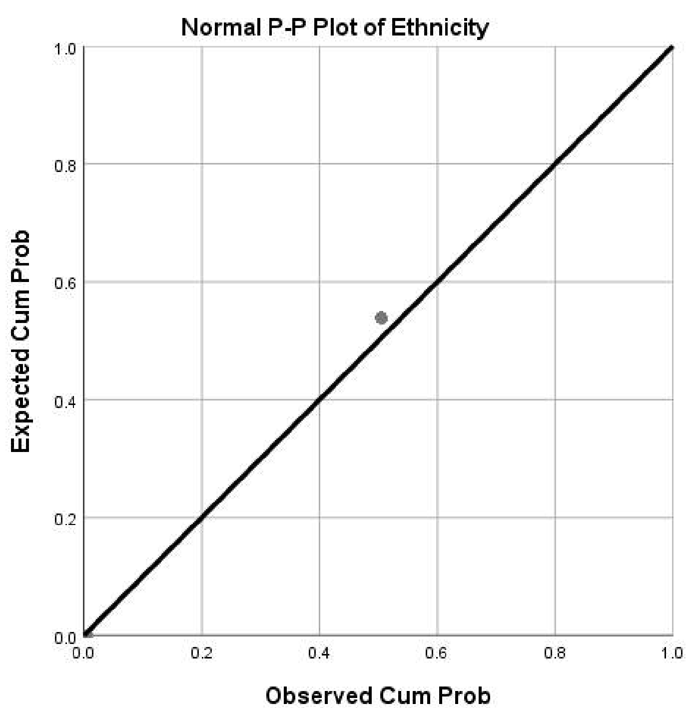


Figure 18 showed the Normal P-P Plot of Ethnicity with all data at 0.47 expected CP and 0.45 of observed CP (see figure 18 above).

Figure 19. Detrended Normal P-P Plot of Ethnicity

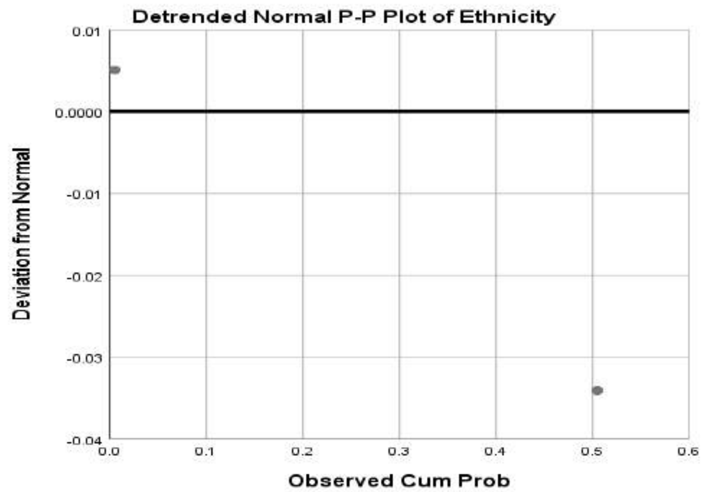


Figure 19 showed approximately 50% of the distributed data at deviation from normal and 50% of the distributed data at observed CP (see figure 19 above).

Figure 20. Normal P-P Plot of Aphypi

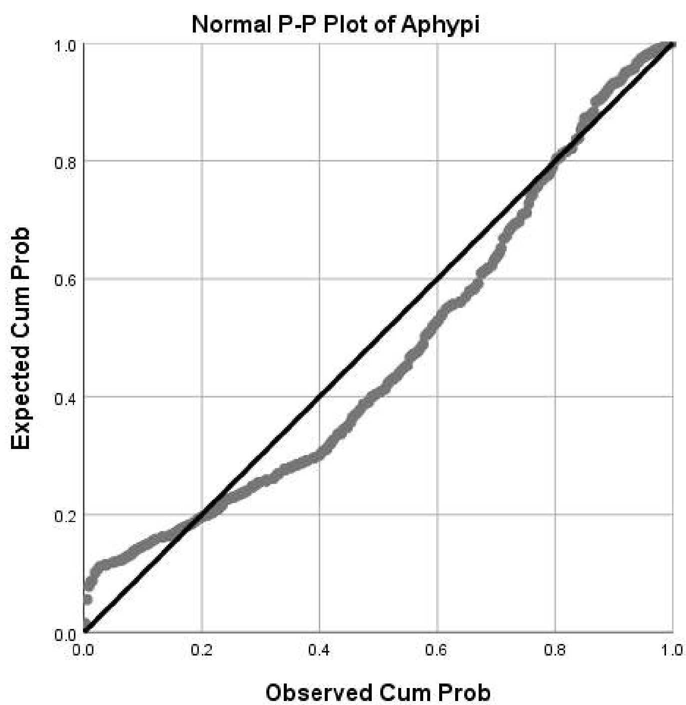


Figure 20 showed the Normal P-P Plot of Ahpypi between expected CP and observed CP (see figure 20 above).

Figure 21. Detrended Normal P-P Plot of Aphypi

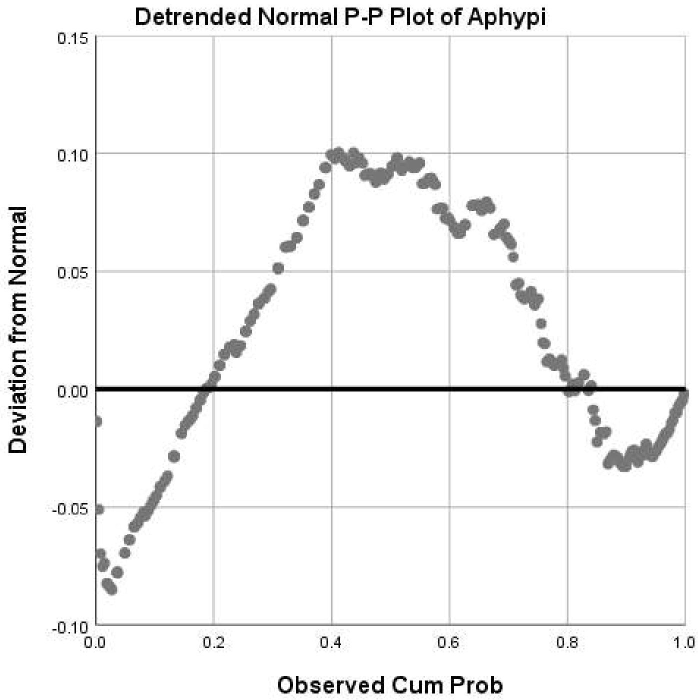


Figure 21 showed the deviation from normal and the observed CP about 60% of data fell above the normal distribution threshold while 40% fell below it (see figure 21 above).

Figure 22. Normal P-P Plot of NeckCM1

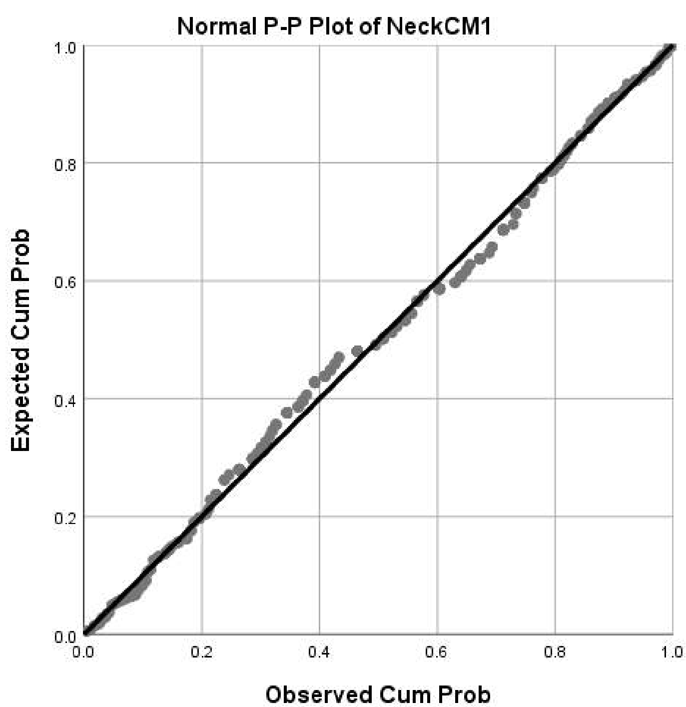


Figure 22 showed the Normal P-P Plot of NeckCM1 expected CP versus the observed CP (see figure 22 above).

Figure 23. Detrended Normal P-P Plot of NeckCM1

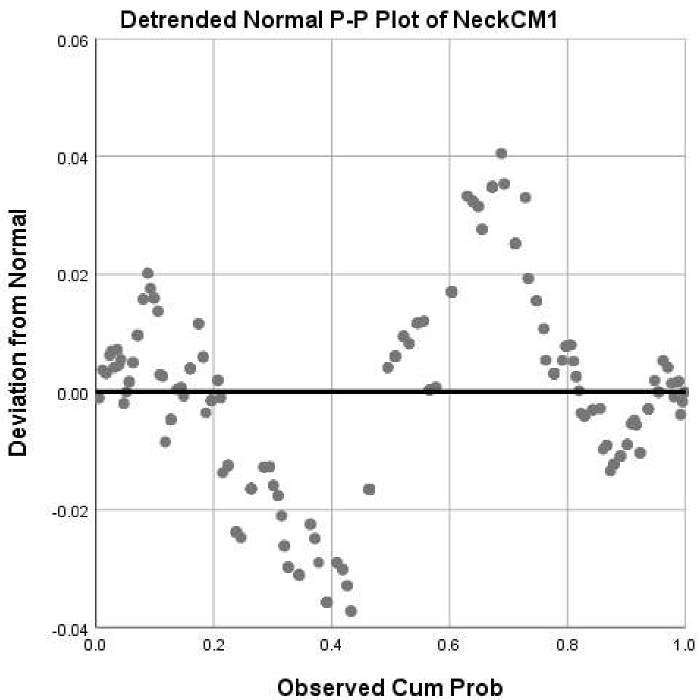


Figure 23 showed the Detrended Normal P-P Plot of NeckCM1 with 50% deviation from normal distribution and 50% within observed CP (see figure 23 above).

Figure 24. Normal P-P Plot of NeckCM2

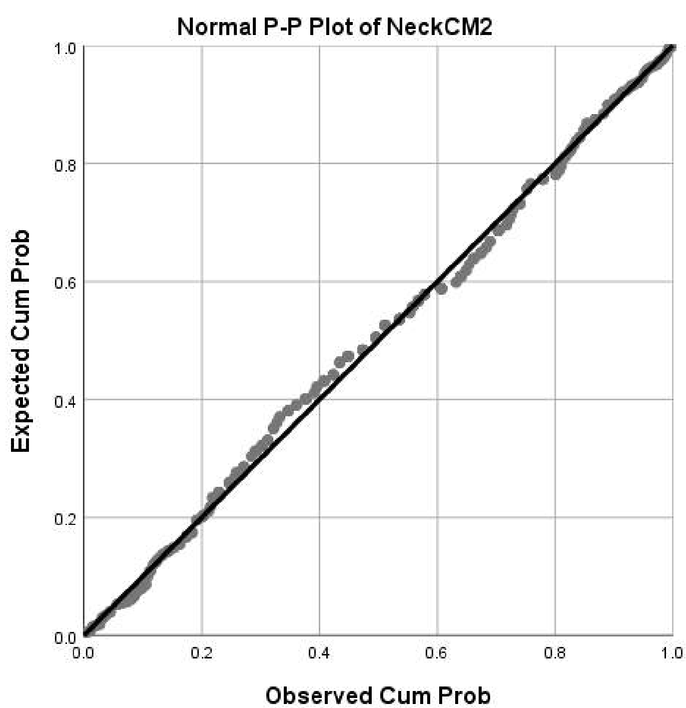


Figure 24 showed the Normal P-P Plot of NeckCM2 differences between expected CP and observed CP as shown above.

Figure 25. Detrended Normal P-P Plot of NeckCM2

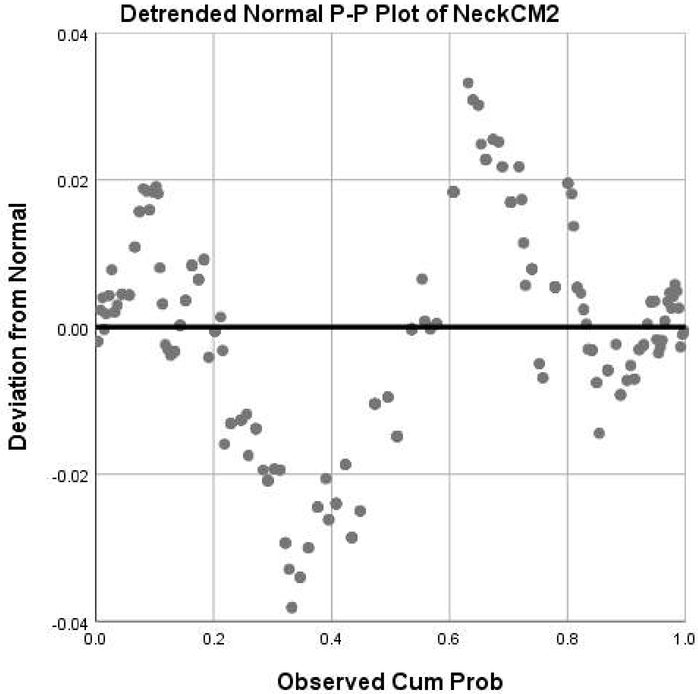


Figure 25 showed the Detrended Normal P-P Plot of NeckCM2 with 50% deviation from normal distribution and 50% within observed CP

Figure 26. Normal P-P Plot of Gender

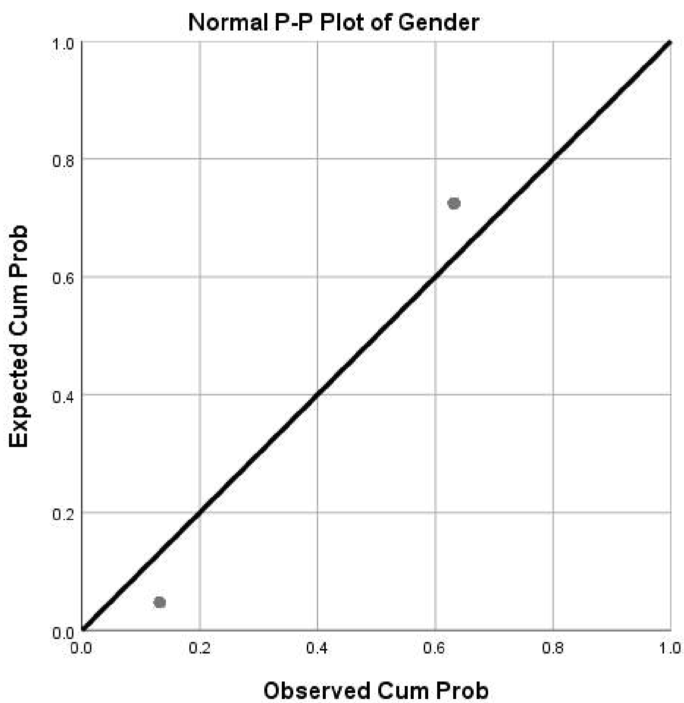


Figure 26 showed Normal P-P Plot of gender with 50% fell within the expected and observed CP as shown above.

Figure 27. Detrended Normal P-P Plot of Gender

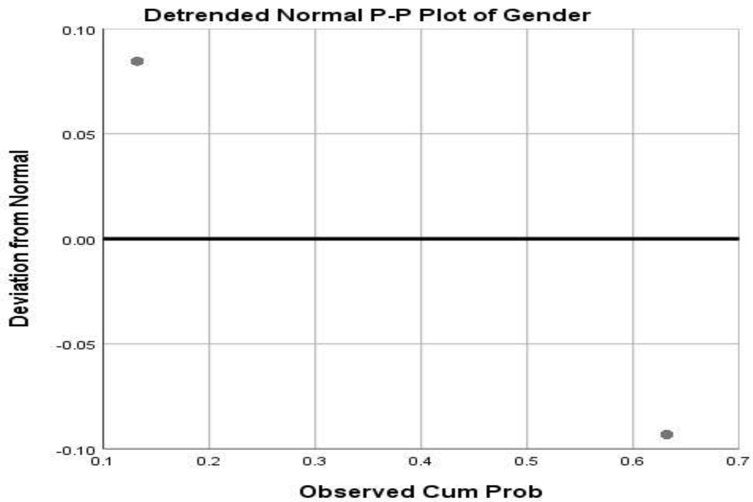


Figure 27 showed the Detrended Normal P-P Plot of gender with 50% above the deviation threshold and 50% below the observed threshold as shown above.

Figure 28. Normal P-P Plot of Race

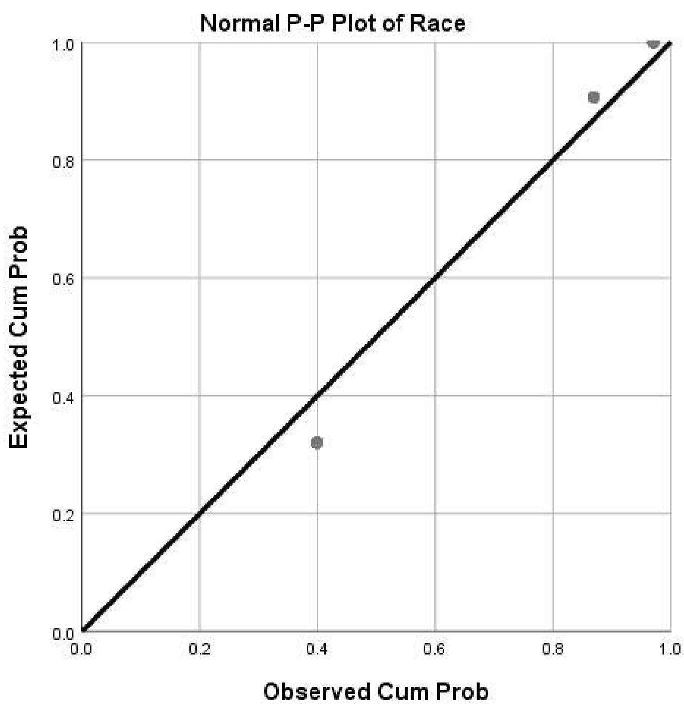
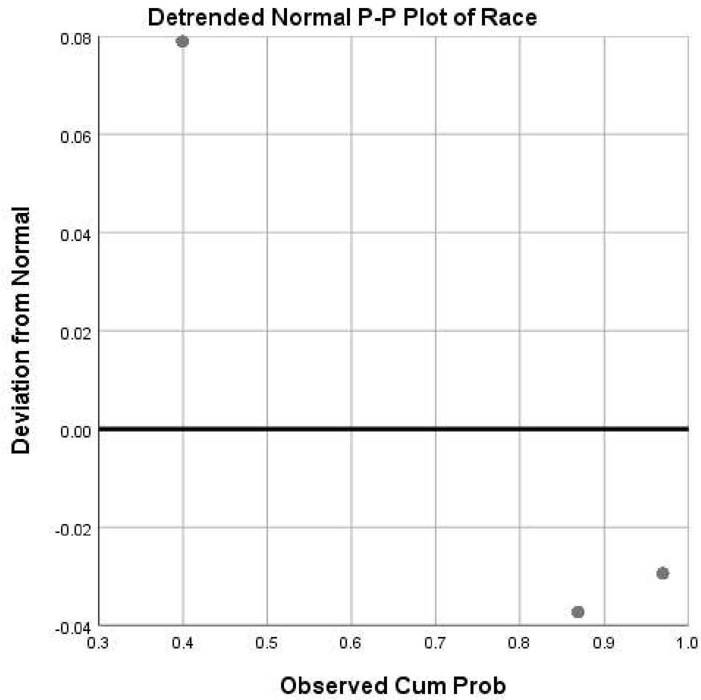


Figure 28 Normal P-P Plot of race with 66.6% above threshold and 33.4% below threshold as shown above.

Figure 29. Detrended Normal P-P Plot of Race



Answers to Supplemental Research Question (RQ3):

RQ 3. There are correlations/relationships between 2 combinations of exercises methods with OSA and BMI outcomes.

The study actually found that there was some positive, negative, and in some cases zero 0% correlations/relationships between 2 combinations of exercises methods with OSA and BMI outcomes as shown below.

Figure 29: Active Walking and Active Jogging Relationship with (OSA or Aphypi) which showed a profound negative likelihood effects as shown below.

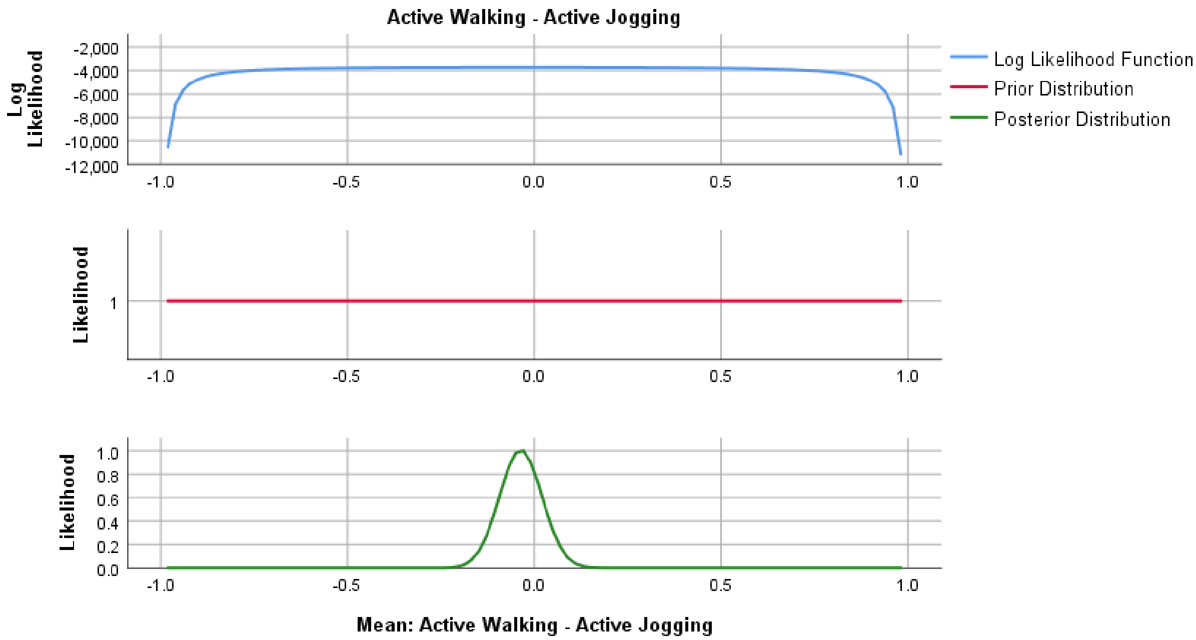


Figure 30: Active Walking and Active Runningwith (OSA or Aphypi) which showed a slightly positive likelihood effects as shown below.

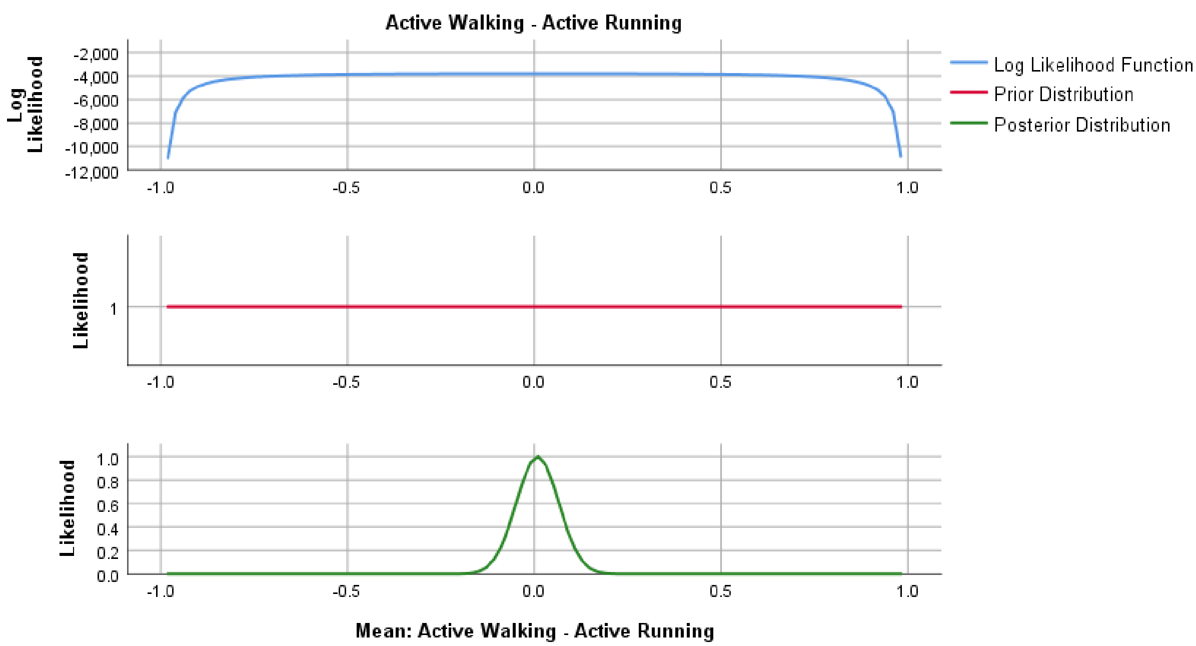


Figure 31: Active Walking and Active Bicyclingwith (OSA or Aphypi) which showed a slight negative likelihood effects as shown below.

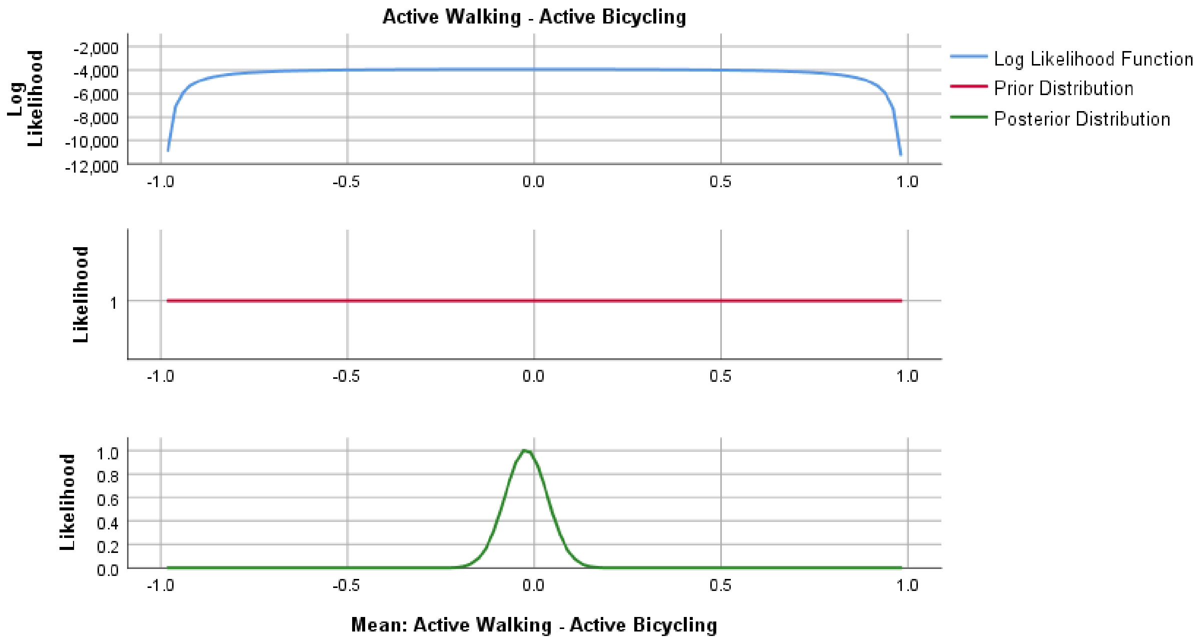


Figure 32: Active Walking and Active Swimmingwith (OSA or Aphypi) which showed a zero likelihood effects as shown below.

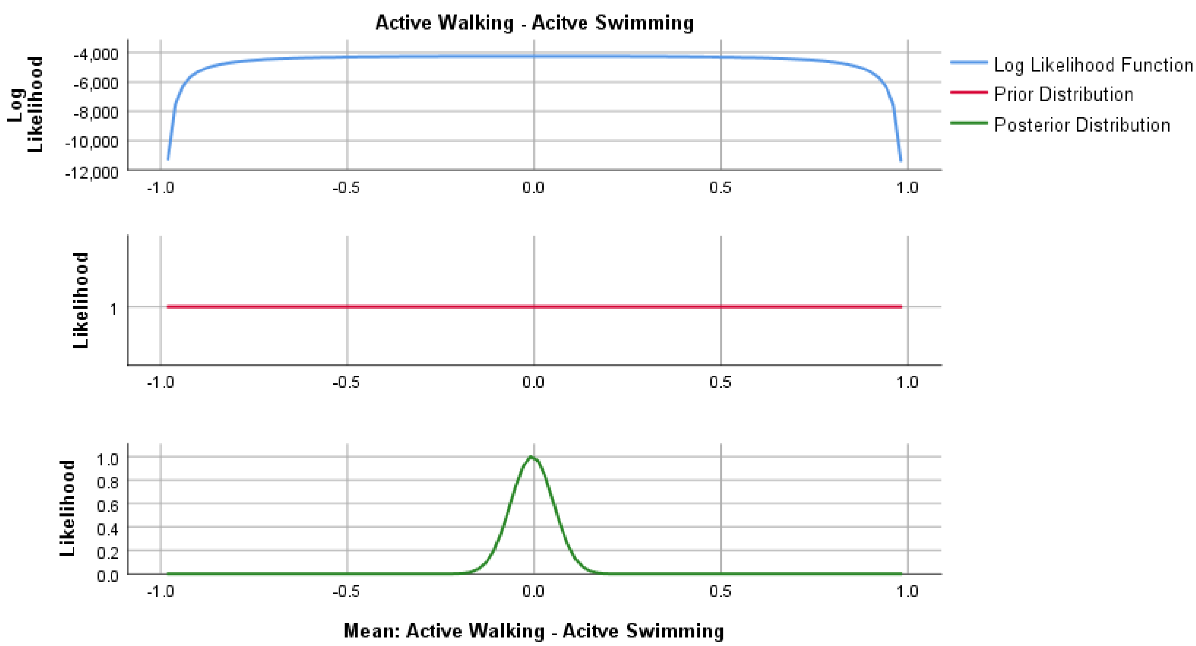


Figure 33: Active Jogging and Active Runningwith (OSA or Aphypi) which showed a profoundly significant higher likelihood effects as shown below.

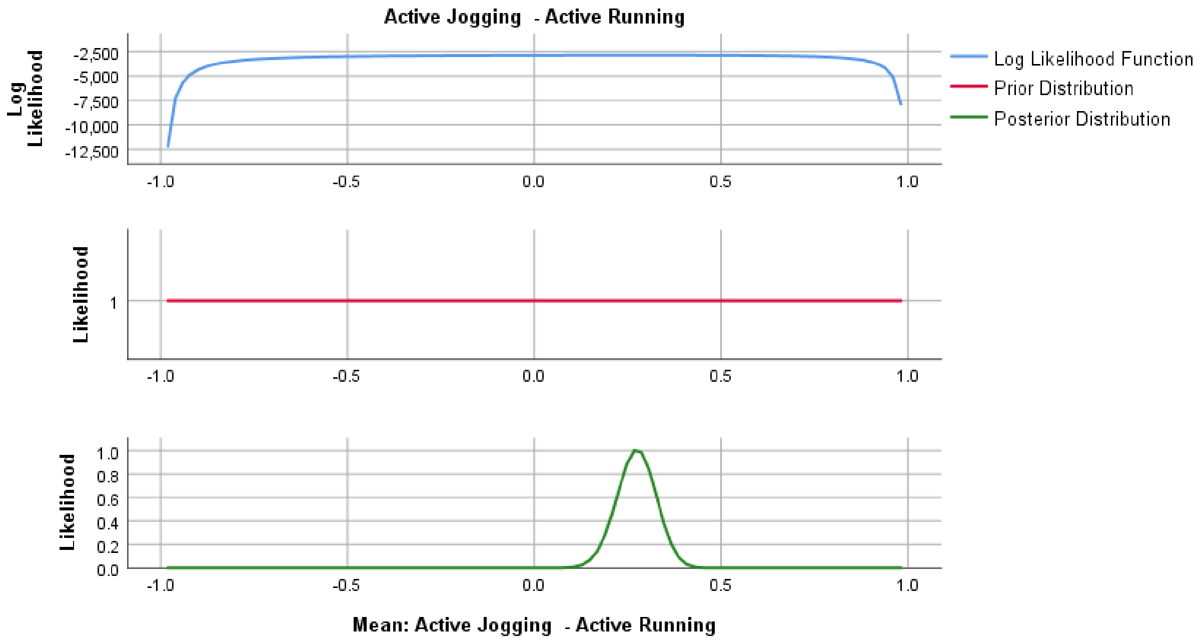


Figure 34: Active Jogging and Active Bicyclingwith (OSA or Aphypi) which showed a significantly high positive likelihood effects as shown below.

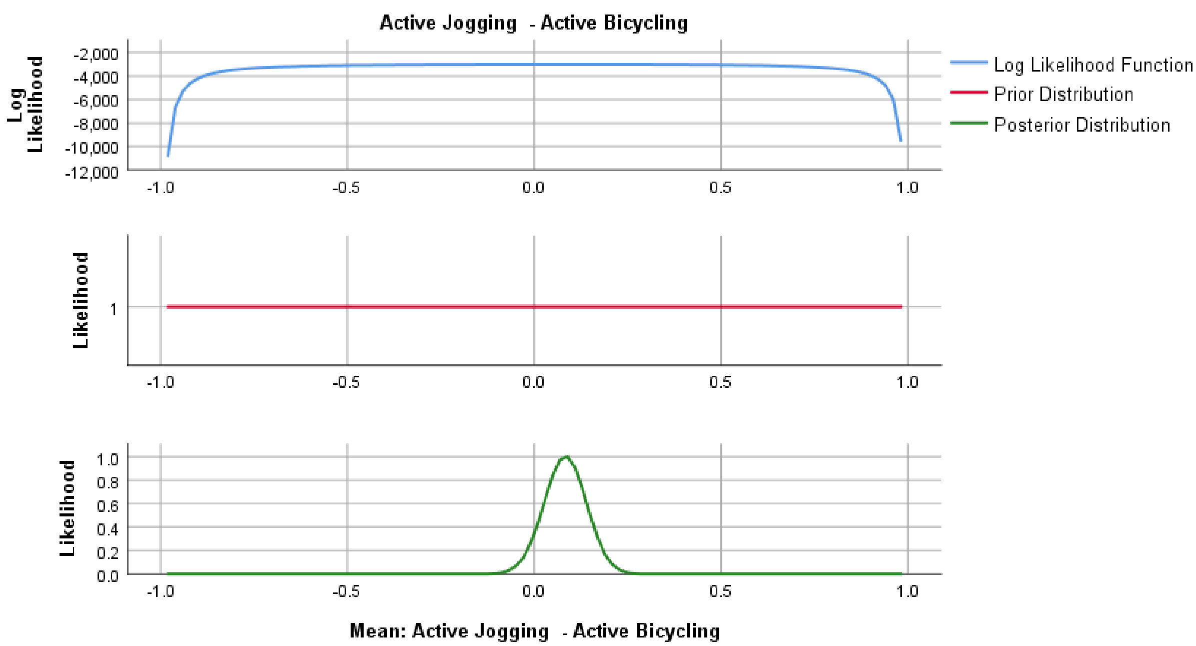


Figure 35: Active Jogging and Active Swimmingwith (OSA or Aphypi) which showed a high reasonable positive likelihood effects as shown below.

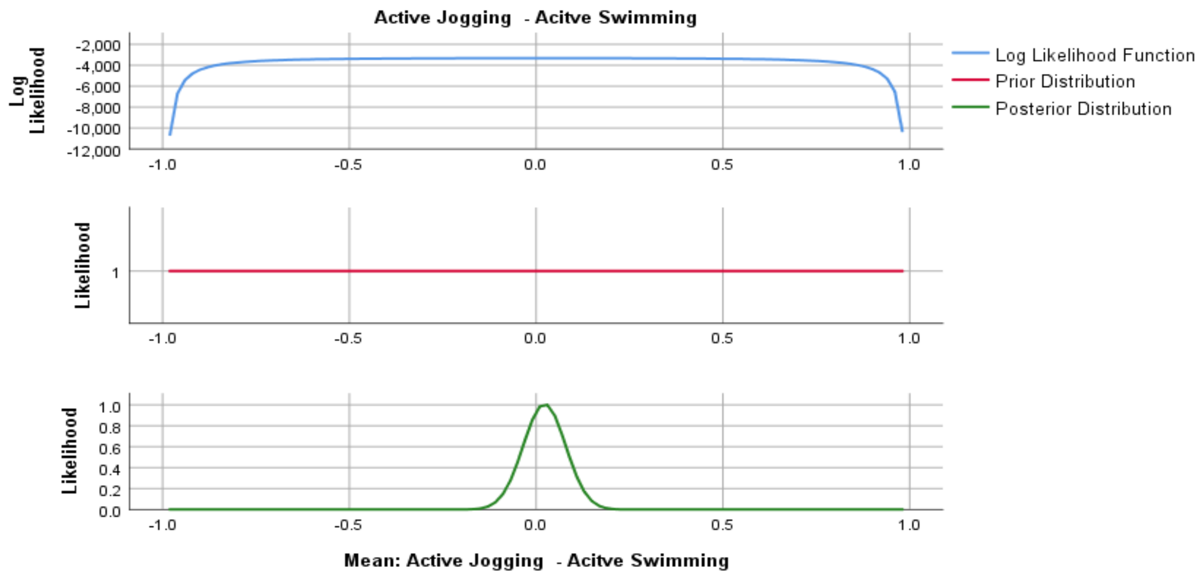


Figure 36: Active Running and Active Bicycling with (OSA or Aphypi) which showed a high reasonable positive likelihood effects as shown below.

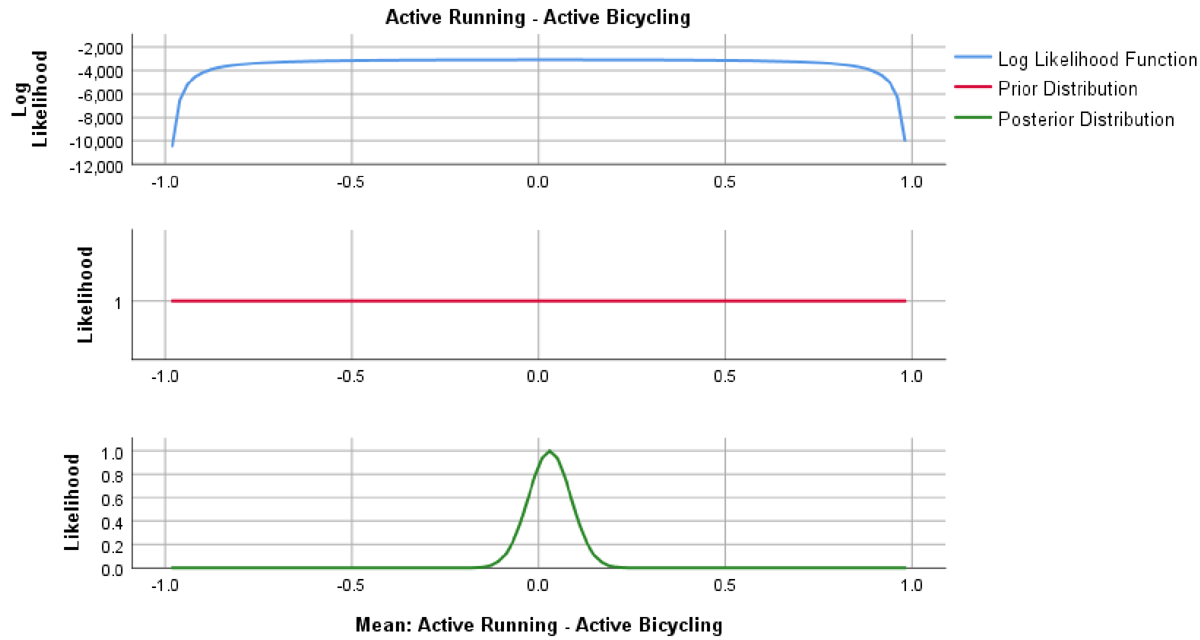


Figure 37: Active Running and Active Swimmingwith (OSA or Aphypi) which showed a zero likelihood effects as shown below.

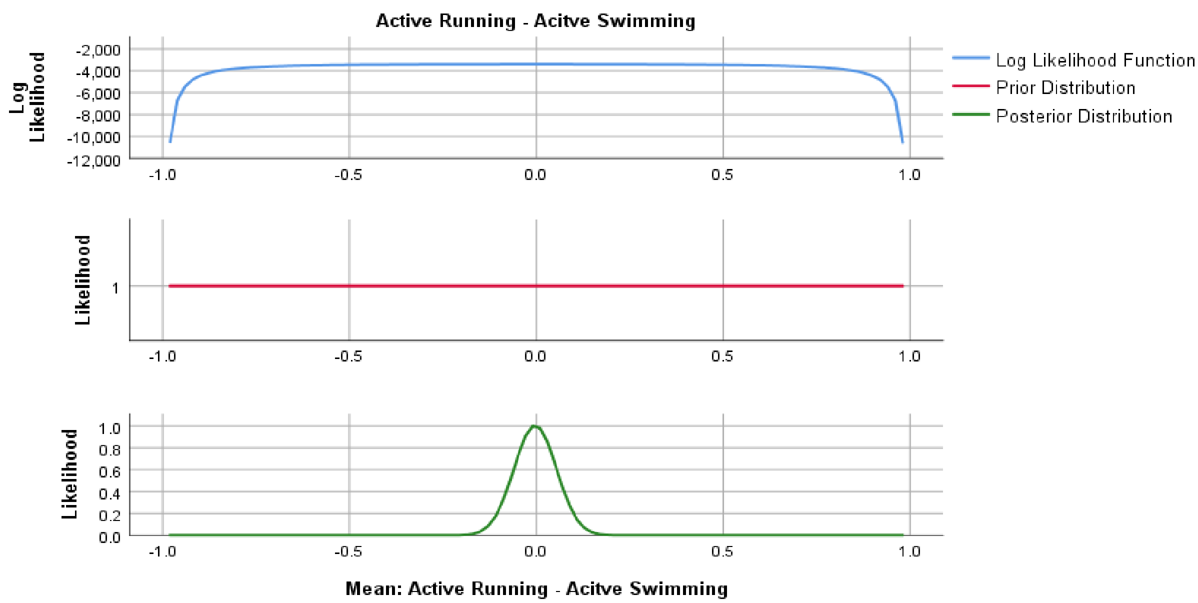
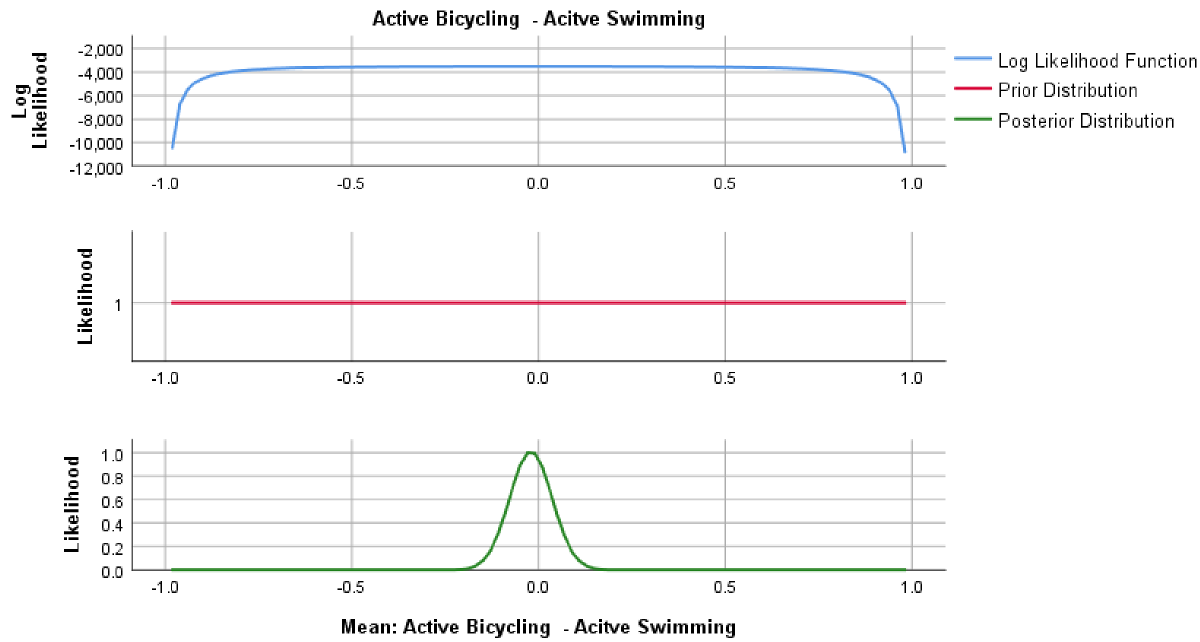


Figure 38: Active Bicycling and Active Swimmingwith (OSA or Aphypi) which showed a negative likelihood effects as shown below.



STATISTICAL INTERPRETATIONS OF THE RESULTS AND FINDINGS OF THE STUDY

The found that when it comes to genders' differences between gender and OSA's Aphypi wellbeing overall effects, there were no statistically significant differences between males and females or children in their overall health wellbeing outcomes. For example, the males performed equally as high and as similar to the females' performances after some slow walking or slow jogging for weeks. The study further found no statistically significant differences between gender's performances after the severity of **Obstructive Sleep Apnea (OSA)** is normally measured with **Apnea Hypopnea Index (AHI).** This AHI used to classify OSA goes this way: mild (5- 15) events per hour, Moderate (15-30) events per hour, Severe (30->) events per hour. Note that this study only analyzed **Severe (30->) events per hour** due to possible overwhelming generation of unneeded tables and figures in this study. Also, the study found no statistically significant differences between age groups as well; because older males or females were able to equally perform effectively as younger boys and girls based on the collected and analyzed dataset statistics (see figures 1 to 20& tables 1 to 11 for more).

Conversely to the above findings and results, the study found that there were profound significant statistical differences between slow or mild walking, or slow or mild jogging and OSA's Aphypi overall health wellbeing outcomes based on the above scheduled weeks and times of exercises. For example, the study found that walking had 100% correlation with OSA's Aphypi while jogging had 96% correlation with OSA overall outcomes benefits to the participants of the study. Both walking and jogging have 100% correlation with OSA'sAphypi due to their performances in the research study. It should be noted that there was one unknown missing number which was insignificant due to 1 out of 302 or 0.003% which could not have swayed the findings or the results of this study anyway (see table 6 for more). Overall, the study found profound statistically significant correlations between slow or mild walking and jogging and OSA's Aphypi overall wellbeing outcomes. Conversely, the study found statistically insignificant corrections between genders and ages differences in OSA's Aphypi performances. However, it should be noted that BMI was not analyzed in this research study; but previous research studies have shown that there were direct positive correlations between slow or mild walking and jogging and the reduction of BMI.

As to answer research question 3 about the outcomes' likelihood of the combinations at least 2 exercises combinations methods are implemented positive or negative correlations/relationships, the study found that there were significant correlations/relationships between 2 combinations of exercises methods with OSA and BMI outcomes in some case. For example, Active Walking and Active Jogging Relationship with (OSA or Aphypi) which showed a profound negative likelihood effects as shown above, Active Walking and Active Runningwith (OSA or Aphypi) which showed a slightly positive likelihood effects as shown above, and Active Walking, Active Bicyclingwith (OSA or Aphypi) which showed a slight negative likelihood effects as shown above, and Active Walking and Active Swimmingwith (OSA or Aphypi) which showed a zero likelihood effects as shown above. Additionally, the study found that Active Jogging and Active Runningwith (OSA or Aphypi) which showed a profoundly significant higher likelihood effects as shown above, Active Jogging and Active Bicyclingwith (OSA or Aphypi) which showed a significantly high positive likelihood effects as shown above, Active Jogging and Active Swimmingwith (OSA or Aphypi) which showed a high reasonable positive likelihood effects as shown above, Active Running and Active Bicycling with (OSA or Aphypi) which showed a high reasonable positive likelihood effects as shown above, and Active Running and Active Swimmingwith (OSA or Aphypi) which showed a zero likelihood effects as shown above. Furthermore, the study found that Active Bicycling and Active Swimmingwith (OSA or Aphypi) which showed a negative likelihood effects as shown above (see figures 23 to 38 for more information). Above all, evidence has shown that systematic and symmetrical gradual reduction of BMI counts always has positive correlations with individualized and groups' health wellbeing overall outcomes (see Kavitha et al., 2018; "BMI Corporate Health"., 2013; Fernbrae Hospital., 2019; BMI The Somerfield Hospital in Maidstone has officially closed"., 2019;tables 1 to 20 and figures 1 to 38 and others for more comprehensive results and fidnings).

SIGNIFICANCE OF THE STUDY

This study sheds light on the significance of moderate exercises such as slow or mild walking or jogging to public health practitioners and patients equally. This study also shed to professional healthcare practitioners to always suggest moderate exercises as a way of systematically overcoming and healthcare issues such as OSA's Aphypi regardless of genders or ages differences.

LIMITATIONS OF THE STUDY

This research study had several limitations as stipulated bellow;

1. Confidential private seconding dataset data were used to conduct this research study; which limits its' comprehensive evaluation of the validity and reliability of the data used in this study.
2. This study cannot be generalized across the board due to the originality of the secondary dataset used in this study.
3. This study used analyses of **"Non-Experimental Research Study" or "Descriptive Statistics"** which is different from real "**Experimental Research Study.**"
4. Finally, the results and findings of the research study are subject to replications by other researchers by using the same dataset' data to comprehensively verify or dismiss its' results and findings.

CONCLUSION AND DISCUSSION

This comprehensive research study addressed some issues associated with OSA's implications which have been debatable by many public health practitioners and public health policies' decision-makers for generations endlessly. Many believed that OSA's Aphypi are sometimes overrated as a serious healthcare condition; while others believed that OSA's Aphypi is a serious healthcare condition that needs to be taken very seriously by all healthcare practitioners. For example, it should be noted that many patients have died due to OSA's Aphypi complexations and complications in their sleep due to lack of treatments. This research study demonstrates that OSA's Aphypi is a very serious private or public healthcare issues that needs to be taken very seriously by all public and private healthcare practitioners; because its' untreated implications can be detrimental to the patients, the patients' family members, and the private, or public healthcare practitioners who knowingly undermine the significance of treating OSA's Aphypi upon its immediate diagnosis. Above all, the simplified types of exercises such as slow walking, slow jogging, active walking, active jogging, active bicycling, active swimming, and active running can profoundly, fundamentally, and positively reduce the implications and complexities associated with the overall outcomes of OSA's Aphypi disease. The study recommends that its results and findings should be implemented comprehensively, as to eventually bring some **POSITIVE SOCIAL CHANGES** to all its participants and beyond.

ACKNOWLEDGEMENTS

This study wants to give a special thanks to the **PVAMU the Division of Research & Innovation (R&I) in response to the Faculty and Staffs of the-Research & Innovation for Scholarly Excellence (RISE)** for their continued supports of such research studies. This study wants to thank **PVAMU College of Education and Los Angeles Pacific University**faculty members for their contribution to this critical research study. Also, this research study wants to thank **PVAMU School of Public & Allied Health the Division of Public Health & Health and Division of Public Allied faculty members and staffs for their continued supports for all researches studies' obligations and commitments.**

CONFLICT OF INTERESTS

This study shares no conflict of interests.

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