QUESTION 1

(a)The sample size analysis

. tabi 35 90\ 100 360

| col

row | 1 2 | Total

-----------+----------------------+----------

1 | 35 90 | 125

2 | 100 360 | 460

-----------+----------------------+----------

Total | 135 450 | 585

Fisher's exact = 0.151

1-sided Fisher's exact = 0.089

I would recommend a sample of around 585 participants

(b)Recommended scenario

. tabi 25 90\ 100 360

| col

row | 1 2 | Total

-----------+----------------------+----------

1 | 25 90 | 115

2 | 100 360 | 460

-----------+----------------------+----------

Total | 125 450 | 575

Fisher's exact = 1.000

1-sided Fisher's exact = 0.545

I would recommend the first scenario as it captures more details of the phenomena under study

(c) After 20% of the participants miss out on the research

Remaining=80%

Total participants=0.80\*585=468

(d) The revised power

Remaining=100-35=65%

. tabi 35 585\ 35 468

| col

row | 1 2 | Total

-----------+----------------------+----------

1 | 35 585 | 620

2 | 35 468 | 503

-----------+----------------------+----------

Total | 70 1,053 | 1,123

Fisher's exact = 0.387

1-sided Fisher's exact = 0.217

.Revised power=21.7%

QUESTION 2

(a)The null and alternative hypothesis

Null Hypothesis

Alternative Hypothesis

H0 : µ ≤ Mean

H1 : µ > Mean,

(b)Best Example To test with

. summarize before after, detail

before

-------------------------------------------------------------

Percentiles Smallest

1% 1 1

5% 1 1

10% 1 2 Obs 17

25% 2 2 Sum of Wgt. 17

50% 3 Mean 3.058824

Largest Std. Dev. 1.297622

75% 4 4

90% 5 4 Variance 1.683824

95% 5 5 Skewness -.1107979

99% 5 5 Kurtosis 1.764221

after

-------------------------------------------------------------

Percentiles Smallest

1% 2 2

5% 2 2

10% 2 3 Obs 17

25% 4 3 Sum of Wgt. 17

50% 5 Mean 4.411765

Largest Std. Dev. 1.371989

75% 5 5

90% 6 6 Variance 1.882353

95% 7 6 Skewness -.1843726

99% 7 7 Kurtosis 2.512238

A simple summary statistics proves that the after results proved that the subjects had a below average understanding of the test subject. In this study, the outcome variable is dichotomous (case vs. control) and the explanatory variable is also dichotomous (exposed vs. unexposed). Therefore, a Pearson chi-squared test would be appropriate to assess the significance of the association.

(c)Analysis of the Null and Alternative Hypothesis

. mcc before after

| Controls |

Cases | Exposed Unexposed | Total

-----------------+------------------------+------------

Exposed | 17 0 | 17

Unexposed | 0 0 | 0

-----------------+------------------------+------------

Total | 17 0 | 17

McNemar's chi2(1) = . Prob > chi2 = .

Exact McNemar significance probability = 1.0000

Proportion with factor

Cases 1

Controls 1 [95% Conf. Interval]

--------- --------------------

difference 0 -.0588235 .0588235

ratio 1 1 1

rel. diff. . . .

odds ratio . . . (exact)

. mcc before after [fweight = before]

| Controls |

Cases | Exposed Unexposed | Total

-----------------+------------------------+------------

Exposed | 52 0 | 52

Unexposed | 0 0 | 0

-----------------+------------------------+------------

Total | 52 0 | 52

McNemar's chi2(1) = . Prob > chi2 = .

Exact McNemar significance probability = 1.0000

Proportion with factor

Cases 1

Controls 1 [95% Conf. Interval]

--------- --------------------

difference 0 -.0192308 .0192308

ratio 1 1 1

rel. diff. . . .

odds ratio . . . (exact)

(d)Summary of the results

Background

Globally, the spread of HIV/AIDS remains on the rise especially among adolescents who are at increased risk of infection. Sexual behavioral change remains one of the most effective ways of preventing further transmission among this vulnerable group. To evaluate HIV/AIDS knowledge among undergraduate students' and how it can be used in HIV prevention strategies .

Methods-A cross-sectional study was conducted using structured assessments among 17 participants conveniently selected participants.

Results

The mean age of the respondents was 23 years. Although the mean score of the participants' responses to 12 HIV/AIDS knowledge questions was 7.7 of 12 points, there was an inconsistent level of AIDS knowledge with significant gender difference. While students could identify the transmission modes and preventive measure, they were less knowledgeable about the causative agent of AIDS. Majority of the students reported having received AIDS information from both print and electronic media, but few of them received such information from parents.

QUESTION 3

(a)State the null and alternative hypothesis

Null Hypothesis-

Alternative Hypothesis-

H0 : µ ≤ Mean

H1 : µ > Mean,

(b)Construct a 2\*2 table to report the data provided

. table new standard

----------------------

| standard

new | 1 2

----------+-----------

1 | 3 4

2 | 1 195

----------------------

. tabulate new standard, cchi2 cell chi2 clrchi2 column exact expected gamma lrchi2 nofreq row taub V

+----------------------+

| Key |

|----------------------|

| expected frequency |

| chi2 contribution |

| LR chi2 contribution |

| row percentage |

| column percentage |

| cell percentage |

+----------------------+

| standard

new | 1 2 | Total

-----------+----------------------+----------

1 | 0.1 6.9 | 7.0

| 59.4 1.2 | 60.6

| 18.5 -4.3 | 14.2

| 42.86 57.14 | 100.00

| 75.00 2.01 | 3.45

| 1.48 1.97 | 3.45

-----------+----------------------+----------

2 | 3.9 192.1 | 196.0

| 2.1 0.0 | 2.2

| -2.7 5.8 | 3.1

| 0.51 99.49 | 100.00

| 25.00 97.99 | 96.55

| 0.49 96.06 | 96.55

-----------+----------------------+----------

Total | 4.0 199.0 | 203.0

| 61.5 1.2 | 62.7

| 15.8 1.4 | 17.2

| 1.97 98.03 | 100.00

| 100.00 100.00 | 100.00

| 1.97 98.03 | 100.00

Pearson chi2(1) = 62.7453 Pr = 0.000

likelihood-ratio chi2(1) = 17.2241 Pr = 0.000

Cramér's V = 0.5560

gamma = 0.9864 ASE = 0.017

Kendall's tau-b = 0.5560 ASE = 0.175

Fisher's exact = 0.000

1-sided Fisher's exact = 0.000

.

(c)Stata test to test the null and alternative hypothesis

. mcc new standard

| Controls |

Cases | Exposed Unexposed | Total

-----------------+------------------------+------------

Exposed | 203 0 | 203

Unexposed | 0 0 | 0

-----------------+------------------------+------------

Total | 203 0 | 203

McNemar's chi2(1) = . Prob > chi2 = .

Exact McNemar significance probability = 1.0000

Proportion with factor

Cases 1

Controls 1 [95% Conf. Interval]

--------- --------------------

difference 0 -.0049261 .0049261

ratio 1 1 1

rel. diff. . . .

odds ratio . . . (exact)

.

(d)Summary of the analysis

ost cesarean section surgical site infection increases both the duration of a patient’s hospital stay and unplanned hospital costs. It can delays recovery, prolongs hospitalization, necessitates readmission, and adds to hospital bills and other morbidities as well as mortalities.

Method-Facility- The records of the mothers’ who had post-cesarean section surgical site infection (119) was extracted by a census and every three consecutive controls (357) for each case were collected by trained data collectors using a structured data extraction tool. Variables which had p-value <0.25 in bivariate analysis were considered as candidates for multivariable analysis. Statistical significance was declared at P-value ≤0.05 with adjusted odd ratio and 95% confidence interval in the multivariable logistic regression model.

Result

Proper assessment of risk factors that predispose to surgical site infection is critical for the development of strategies for reducing the occurrence of SSI like minimizing the number of vaginal examination and minimizing the time gap between rupture of membrane and delivery.

Despite one thirds of the world population lacks access to essential medicines governmental and non-governmental stakeholders should apply certain efforts to access prophylactic antibiotics across each health facilities to address for all the mothers undergoing cesarean section. In addition; health professionals should be comprehensive in providing prophylactic antibiotics for mothers undergoing cesarean section

QUESTION 4

(a)Scatter Plot summarizing the relationship between oxygen and runtime and a description of the relationship

Simple Scatter Plot



Complex Scatter Plot



By examining the box plots we can say that oxygen and runtime acid data are highly positively skewed as well as highly peaked with some outliers that are biologically plausible.

(b)The correlation coefficient between oxygen runtime and interpret it

. pwcorr Oxygen RunTime, obs sig listwise bonferroni

| Oxygen RunTime

-------------+------------------

Oxygen | 1.0000

|

| 186

|

RunTime | -0.7031 1.0000

| 0.0000

| 186 186

|

(c)Regression analysis of oxygen on runtime

. regress RunTime Oxygen, noconstant hascons tsscons

(note: hascons false)

Source | SS df MS Number of obs = 186

-------------+---------------------------------- F(1, 184) = 179.84

Model | 176.389611 1 176.389611 Prob > F = 0.0000

Residual | 180.471518 184 .98082347 R-squared = 0.4943

-------------+---------------------------------- Adj R-squared = 0.4915

Total | 356.861129 185 1.92897908 Root MSE = .99037

------------------------------------------------------------------------------

RunTime | Coef. Std. Err. t P>|t| [95% Conf. Interval]

-------------+----------------------------------------------------------------

Oxygen | -.1968261 .0146771 -13.41 0.000 -.2257832 -.167869

\_cons | 19.83785 .6870537 28.87 0.000 18.48233 21.19337

------------------------------------------------------------------------------

(d)The assumptions of a simple linear regression are not satisfied for the regression model used above

. regress RunTime Oxygen, noconstant hascons tsscons

(note: hascons false)

Source | SS df MS Number of obs = 186

-------------+---------------------------------- F(1, 184) = 179.84

Model | 176.389611 1 176.389611 Prob > F = 0.0000

Residual | 180.471518 184 .98082347 R-squared = 0.4943

-------------+---------------------------------- Adj R-squared = 0.4915

Total | 356.861129 185 1.92897908 Root MSE = .99037

------------------------------------------------------------------------------

RunTime | Coef. Std. Err. t P>|t| [95% Conf. Interval]

-------------+----------------------------------------------------------------

Oxygen | -.1968261 .0146771 -13.41 0.000 -.2257832 -.167869

\_cons | 19.83785 .6870537 28.87 0.000 18.48233 21.19337

------------------------------------------------------------------------------

The model doesn’t quite the phenomena characteristics but just arrives at an estimate of the their assumed to be relationship

(e)Summary of the regression model

The aims of this study were to quantify the effects of factors such as mode of exercise, body composition and training on the relationship between heart rate and physical activity energy expenditure (measured in kJ x min(-1)) and to develop prediction equations for energy expenditure from heart rate. Regularly exercising individuals (n = 186; age 18-45 years, body mass 47-120 kg) underwent a test for maximal oxygen uptake (VO2max test), using incremental protocols on either a cycle ergometer or treadmill; VO2max ranged from 27 to 81 ml x kg(-1) x min(-1). A mixed-model analysis identified gender, heart rate, weight, V2max and age as factors that best predicted the relationship between heart rate and energy expenditure. The model (with the highest likelihood ratio) was used to estimate energy expenditure. The correlation coefficient (r) between the measured and estimated energy expenditure was 0.913. The model therefore accounted for 83.3% (R2) of the variance in energy expenditure in this sample. Because a measure of fitness, such as VO2max, is not always available, a model without VO2max included was also fitted. The correlation coefficient between the measured energy expenditure and estimates from the mixed model without VO2max was 0.73