

UNIVERSITY OF JAFFNA, SRI LANKA
FACULTY OF ALLIED HEALTH SCIENCES
THIRD YEAR FIRST SEMESTER EXAMINATION IN BScHons (MLS)- 2022
MLSRM 3113 RESEARCH METHODOLOGY AND MEDICAL STATISTICS

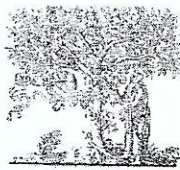
Date: 10.01.2024

Time: 3 Hours

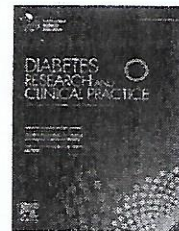
Answer all Four Questions. Marks allotted to each part are given in brackets.
Answer part A, B, C and D in separate answer books.

Part A

1. A research abstract published in an authenticated peer-reviewed journal is given,
 - 1.1. Name the Journal and its Publisher. (10 Marks)
 - 1.2. Mention the knowledge gap studied in this research. (15 Marks)
 - 1.3. Name the study design applied in the given study. (10 Marks)
 - 1.4. Briefly explain the term “Double-blind peer review”. (15 Marks)
 - 1.5. List two (02) indicators (Journal metrics) used to check the quality of a journal. (10 Marks)
 - 1.6. State the recommendation suggested by the authors in the given report. (15 Marks)
 - 1.7. Briefly explain the reasons authors did stepwise regression analysis in this research. (15 Marks)
 - 1.8. Name one (01) statistical test used to determine the normality distribution of data. (10 Marks)



Contents available at ScienceDirect

Diabetes Research
and Clinical Practicejournal homepage: www.elsevier.com/locate/diabresInternational
Diabetes
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Serum lactate levels are associated with serum alanine aminotransferase and total bilirubin levels in patients with type 2 diabetes mellitus: A cross-sectional study

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Liver steatosis

Type 2 diabetes mellitus

ABSTRACT

Aims: It was recently reported that lactate acts as a metabolic mediator and rises in the diabetic state, but the physiological effects are as yet poorly understood. The objective of the current study was to evaluate the significance of serum lactate elevation in type 2 diabetes mellitus (T2DM) patients.

Methods: Fasting serum lactate levels, hematological and inflammatory serum markers and anthropometric parameters, obtained employing bioelectric impedance analysis, were measured in 103 patients with T2DM.

Results: Statistically significant correlations of serum lactate levels with C-reactive peptide, insulin, aspartate aminotransferase, alanine aminotransferase (ALT), serum lipids, total bilirubin, adiponectin, homeostasis model assessment-insulin resistance, body weight, body mass index and body fat (weight or percentage of subcutaneous fat, visceral fat or total body fat), but neither fasting plasma glucose nor HbA1c, were detected. Stepwise regression analysis showed ALT to be independently positively associated with total bilirubin, while being negatively associated with serum lactate levels. Furthermore, serum lactate levels were significantly higher in patients with ALT-predominant liver dysfunction.

In conclusion, we found that fasting serum lactate elevation on T2DM was associated with serum levels of ALT and total bilirubin, independently of blood glucose control. Further clinical or basic research is warranted to elucidate the mechanism underlying the influence of rising serum lactate levels on the progression of liver dysfunction.

Abbreviations: T2DM, type 2 diabetes mellitus; MCP-1, monocyte chemotactic protein 1; AST, aspartate aminotransferase; ALT, alanine aminotransferase; γ -GTP, γ -glutamyl transpeptidase; ALP, alkaline phosphatase; LD, lactate dehydrogenase; BUN, blood urea nitrogen; Cr, creatinine; LDL, low-density lipoprotein; HDL, high-density lipoprotein; HOMA-R, homeostasis model assessment-insulin resistance; BMI, body mass index; GPR, G protein-coupled receptor; Ccr, creatinine clearance; NAFLD, non-alcoholic fatty liver disease.

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Part B

2.

2.1 Describe the following terms

- 2.1.1 Null hypothesis (15Marks)
- 2.1.2 Alternate hypothesis (15Marks)
- 2.1.3 P value (15Marks)
- 2.1.4 Type I error (15Marks)

2.2 Please mention the suitable statistical test for following association of variables and give reasons for the selection.

- 2.2.1 BMI category Vs Presence of Stroke (10Marks)
- 2.2.2 Pre intervention Blood Pressure Vs Post intervention Blood Pressure (10Marks)
- 2.2.3 Height Vs Gender (10Marks)
- 2.2.4 Habit of smoking Vs Myocardial Infection (10Marks)

Part C

3. The below image is a part of an abstract of a study conducted in Sri Lanka.

Amarasinghe et al. *BMC Pediatrics* (2017) 17:87
DOI 10.1186/s12887-017-0841-9

BMC Pediatrics

RESEARCH ARTICLE

Open Access

Factors associated with anemia among Sri Lankan primary school children in rural North Central Province



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Thilini Chanchala Agampodi and Suneth Buddhika Agampodi

Abstract

Background: Despite interventions, childhood anemia is still a major public health problem in low and middle income countries. Purpose of the present study is to determine factors associated with anemia among rural primary school children in Sri Lanka, a country undergoing rapid socioeconomic changes.

3.1.

3.1.1. Mention whether this research is of a qualitative or quantitative research.

(20 Marks)

3.1.2. Mention the general objective of this research.

(10 Marks)

3.1.3. Mention the specific objectives of this research.

(20 Marks)

- 3.2. Assume the researchers determined a sample size of 600, from a study population consists five schools labeled A, B, C, D, and E, with the populations of 250, 150, 80, 120, and 300, respectively.
- 3.2.1. Propose a possible probability sampling method for this study. (20 Marks)
- 3.2.2. Describe the process to select the sample of 600 students for this investigation from the given study population. (30 Marks)

Part D

- 4.
- 4.1. The number of patients attended to 60 dispensaries in a district on a day is given in the table below

No of patients attended	Frequency
10-12	04
13-15	12
16-18	24
19-21	14
22-24	06

Find the following from the given data.

- 4.1.1 Mean (10 Marks)
- 4.1.2 Median (10 Marks)
- 4.1.3 Mode (10 Marks)
- 4.1.4 standard deviation (10 Marks)
- 4.1.5 Measures of skewness (10 Marks)
- 4.1.6 coefficient of variation (10 Marks)
- 4.2. In a certain country, the time taken for a common infection to clear up is normally distributed with mean μ days and standard deviation 2.6 days. 25% of these infections clear up in less than 7 days.
- 4.2.1. Find the value of μ . (25 Marks)
- 4.2.2. In another country, the standard deviation of the time taken for the infection to clear up is the same as in the above part, but the mean is 6.5 days. The time taken is normally distributed. Find the probability that, in a randomly chosen case from this country, the infection takes longer than 6.2 days to clear up. (15 Marks)