FACULTY OF ALLIED HEALTH SCIENCES ,UNIVERSITY OF RUHUNA

Department of Nursing

4th End Semester Examination-2022-12th Batch

Statistics & Epidemiology in Nursing (NUR-2252)-SEQ

Date: 22/12/2022 Time: 10.45 a.m.-11.45 a.m. Duration: 1 hour

Index Number: .....

Answer all questions

1.

1.1 List three (03) examples of ratio scale variables. (09 marks)

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1.2 List three (03) characteristics of standard normal distribution. (09 marks)

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1.3 The sample mean of the platelet count of 60 students was 250 x 10^6/L with the 95% confidence interval of (250 ± 20) x10^6/L. (12 marks)
Explain this statement.

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1.4 Computer literacy of a group of 200 randomly selected nurses was obtained. Results are given below.

	Male	Female
Literate	100	70
Illiterate	20	10

The researcher is interested in identifying whether there is a gender difference of computer literacy level of this target population.

State the null and alternative hypothesis. (10 marks)

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1.5. Test the null hypothesis at 5% significance level. (40 marks)

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Answer all questions. Kindly use the given space for the answers.

2.1 Read the following abstract and answer the questions given below.

Interplay between demographic, clinical and polygenic risk factors for severe COVID-19
Crossfield et al., International Journal of Epidemiology, 2022: 51 (5) 1384–1395

Background
We aimed to identify clinical, socio-demographic and genetic risk factors for severe COVID-19 (hospitalization, critical care admission or death) in the general population.

Methods
In this observational study, we identified 9560 UK Biobank participants diagnosed with COVID-19 during 2020. A polygenic risk score (PRS) for severe COVID-19 was derived and optimized using publicly available European and trans-ethnic COVID-19 genome-wide summary statistics. We estimated the risk of hospital or critical care admission within 28 days or death within 100 days following COVID-19 diagnosis, and assessed associations with socio-demographic factors, immunosuppressant use and morbidities reported at UK Biobank enrolment (2006–2010) and the PRS. To improve biological understanding, pathway analysis was performed using genetic variants comprising the PRS.

Results
We included 9560 patients followed for a median of 61 (interquartile range = 34–88) days since COVID-19 diagnosis. The risk of severe COVID-19 increased with age and obesity, and was higher in men, current smokers, those living in socio-economically deprived areas, those with historic immunosuppressant use and individuals with morbidities and higher co-morbidity count. An optimized PRS, enriched for single-nucleotide polymorphisms in multiple immune-related pathways, including the 'oligoadenylate synthetase antiviral response' and 'interleukin-10 signaling' pathways, was associated with severe COVID-19 (adjusted odds ratio 1.32, 95% CI 1.11–1.58 for the highest compared with the lowest PRS quintile).

Conclusion
This study conducted in the pre-SARS-CoV-2-vaccination era, emphasizes the novel insights to be gained from using genetic data alongside commonly considered clinical and socio-demographic factors to develop greater biological understanding of severe COVID-19 outcomes.

(10 marks)

2.1.1 What is the study design used in above study?

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2.1.2 List the variables used to evaluate the risk of having severe COVID-19 in this study.

(30 marks)

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2.2 What is the difference between epidemic vs. pandemic? (20 marks)

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2.3 Read following abstracts and answer the questions given below.

Incidence and Risk Factors for Delirium in Older Patients Following Intensive Care Unit Admission: A Prospective Observational Study
Xiao et al., Journal of Nursing Research 2020; 28(4) e101

Background- Both high prevalence and incidence rates of delirium occur frequently among patients aged 65 years or older in intensive care units (ICUs) and are accompanied by adverse outcomes. Because of lack of nursing staff resources and imperfect humanistic care, delirium is easily overlooked by both physicians and nurses in the ICU in Mainland China.

Purpose This study aimed to explore the incidence rate of delirium and to determine the risk factors among critically ill older patients.

Methods A prospective observational study was conducted on patients aged 65 years and older who were admitted consecutively to two ICUs of a university-affiliated hospital in China. The Confusion Assessment Method for the Intensive Care Unit and the Richmond Agitation–Sedation Scale were used to assess delirium status twice daily. Patient demographic, laboratory, medical, therapeutic, and prognostic data were collected.

Results One hundred fifteen patients were included as participants, with a median age of 70 years (range 65–93 years). Seventy-six (66.1%) patients presented with delirium. Half of the sample had a hypoactive subtype. Patients who developed delirium had a longer mean length of ICU stay, greater chance of physical restraints use, greater use of fentanyl, and poorer sleep quality. A logistic regression analysis revealed that poor sleep quality (*OR* = 10.74, 95% CI [1.59, 72.47]) and physical restraints (*OR* = 13.04, 95% CI [1.57, 107.94]) were significantly associated with delirium.

Conclusions Delirium is a common aggravation in older patients following ICU admission. The factors found in this study to be independently associated with delirium include poor sleep quality and physical restraints. Both critical care physicians and nurses should pay greater attention to the quality of the ICU stay experienced by their older patients

2.3.1 Write formula to calculate followings.

a. Prevalence (10 marks)

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b. Incidence (10 marks)

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2.3.2 What is the study design used in above study? (20 marks)

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