NR503 Mid-term study guide filled in

Population Health, Epidemiology & Statistical Principles (Chamberlain University)

Week 1 Summary & Key points:

1. It is vital to connect **social justice theory** to advocacy, health disparities and to outcomes.
2. How are **outcomes** determined?
3. Where can morbidity, mortality, incidence and prevalence data be found at the state and national level?
    a. State Department of health website; NCCDPHP
        i. (NCCDPHP) The CDC's National Center for Chronic Disease Prevention and Health Promotion consists of nine divisions that support a variety of activities that improve the nation's health by preventing chronic diseases and their risk factors
        ii. National, state, and community levels
    b. CDC, the National Center for Health Statistics (NCHS) is considered the nation's principal health statistics agency
    c. CDI - 97 indicators
4. How does social justice and health inequities influence population health care provision?
5. Why is this critical information for the provision of evidence-based care?
6. Are you able to both define and apply key terms, such as: vital statistics, morbidity, mortality, cases, social justice, epidemiology, population health, incidence, prevalence, outcomes, inter-professional collaboration, HP2020, determinants of health, risk analysis?
7. What is the Campaign for Action?
8. Explain the differences between primary
    a. **Primary** prevention refers to preventing disease before it occurs. (prevention and planning) Usually, primary prevention occurs through application of epidemiological concepts and databases to assess risk factors and then target those populations in which there can be the greatest impact on outcomes to ward off impending disease or unhealthy outcomes. For example, if the APN has assessed epidemiological data and observes that there is a high incidence and prevalence of lung cancer in those individuals and populations who smoke before the fifth grade, then this epidemiological data can be the basis for planning a smoking cessation educational program for school-age children before the fifth grade.
    b. **Secondary -** Secondary prevention consists of screening and diagnosis of disease. Secondary prevention is one of the most cost-effective strategies to improve current health status and prevent chronic, debilitating disease states through screening of individuals and populations. For example, screening helps APNs detect a disease once it is present and assist and facilitate the patient or population to get care for the disease that has been detected. The APN must be knowledgeable and apply standards of care and accepted national clinical guidelines to advise the individual or population to undergo preventive screening that is age appropriate and developmentally appropriate
    c. **Tertiary** intervention - Tertiary prevention consists of interventions aimed at interventions to facilitate the rehabilitation of the patient to the highest level of functioning while addressing the risk factors that could further result in the deterioration of the patient's health. For example, an APN would counsel a patient who has had a myocardial infarction about the risk factors that could elicit further debilitation. The client may be encouraged to lose weight and commit to an appropriate exercise program while being closely monitored for cholesterol levels, and so on. Certainly a cardiac rehabilitation program could be of value to this patient. As stated above, accepted national clinical guidelines should be utilized as a benchmark for this follow-up care

Week 2 Summary & Key points:

1. In conclusion, the control of infectious disease presents a challenge to the APN on many fronts. The ability to provide effective population-based interventions, in addition to fulfilling legal obligations, can have a profound positive impact on the nation's health.
2. Screening/diagnostic tools are often created for population specific use; for instance, gender, age, culture.
3. Screening/diagnostic tools should be tested and have available statistics that speak to their specificity, sensitivity, and positive predictive value.
4. Descriptive epidemiology: Did you see this definition on the CDC web site ...these elements connect to understanding causation:
5. https://www.cdc.gov/ophss/csels/dsepd/ss1978/lesson1/section6.html (Links to an external site.)Links to an external site.
6. The 5W's of descriptive epidemiology:
    a. What = health issue of concern
    b. Who = person
    c. Where = place
    d. When = time
    e. Why/how = causes, risk factors, modes of transmission
7. Is screening a tertiary intervention? If yes, why, if not, what is it?
8. How does a provider determine the usefulness, appropriateness, of a screening test? Where would a NP look to find a screening test? What determines if a screening test should be used?
9. Can you explain what "descriptive epidemiology" means? What is the purpose? How is it used?
10. How are causation and descriptive epidemiology related, how do they work together to aid evidence-based care?
11. What does "causation" mean? Can you relate causation to primary, secondary and tertiary interventions?

Week 3 Summary & Key points:

(Review Table 4.2 in your text on strengths and weaknesses of study designs. For example, what is the best fit for studying **association**? Which study is typically least expensive and shorter? What are study methods?)

1. The Randomized Control Trial is the gold standard for research, and it utilizes intervention testing.
2. Case-control designs
3. Cohort study designs

Consider, recruitment methods, costs of study, retrospective versus prospective analysis results, bias (systematic errors (information bias, etc.), errors (random and systematic), data collection, causality, scientific misconduct (fraud). (See table 4.2 in your text on strengths and weaknesses of study designs.)

1. What is a case-control study and how does it differ (or how is it the same) as the cohort study design?
2. Can you talk about the ways bias shows up in a study design (such as, selection bias) etc.?
3. What is different in a randomized control trial than, for instance, a case-control study (or a cohort study)? What does it mean to show a causal relationship?
4. What is each type of study used for, its purpose, and its outcomes? How are the outcomes different in each study design? Measured?
5. What is an intervention group? Where is it found?
6. Can you explain a retrospective versus a prospective study design? What are the pros and cons of each?
7. How are groups selected for each of the study designs?
8. What is meant by "scientific misconduct"?

9. Differentiate: random error, systematic error, confounding error.

Week 4 Summary & Key points:
This week there was a web site exploration activity involving the IHI, Campaign for Action and IHI Triple Aim. These web sites presented information regarding population health outcomes and health care economics. Inter-professional collaboration was addressed in the Campaign for Action site.

1. What is the Research Pyramid demonstrating the levels of evidence? Where does the RCT fit? Why?
2. Quality of Care Outcomes: Examples: Decrease in incidence (new cases), reduction in mortality rates, access to primary care measures, satisfaction measures, daily demand and supply

1. **Epidemiology** is the science of public health.
   - Epidemiology is the study of disease distribution within populations and the risk factors that affect increases or decreases in distribution. These factors might be genetic, environmental, social, cultural, or based on some direct action by the individual. The science of epidemiology serves first to find out the "why" of disease and then to analyze these factors for recommendations in disease screening, treatment, prevention, and monitoring.
2. **Population health** focuses on risk, data, demographics and outcomes.
3. **Outcomes** is the end result that follows an intervention.
4. **Aggregate** is a defined population.
5. **Community** is composed of multiple aggregates.
6. **Data** is compiled information.
7. **Prevalence** measures the existence of a disease. Measures the number of all cases of a disease or attribute in a population at a given time.
8. **Incidence** measures the appearance of a disease. Measures the occurrence of new events in a population over a period of time.
9. **Surveillance** is the collection, analysis, and dissemination of data.
10. **High-risk** is an increased chance of poor health outcome.
11. **Morbidity** is the presence of illness in a population.
12. **Mortality** is related to the tracking deaths in an aggregate.
13. **Vital statistics-**statistics on live births, deaths, fetal deaths, marriages and divorces.
14. **Cases**- set of criteria used in making a decision as to whether an individual has a disease or health event of interest
15. **Social Justice-** the view that everyone deserves equal rights and opportunities —this includes the right to good health.
16. **Inter-professional collaboration-** The idea of sharing and implies collective action oriented toward a common goal, in this case, improving the quality and safety of patient care. It involves responsibility, accountability, coordination, communication, cooperation, assertiveness, mutual respect, and autonomy.
17. **HP2020-** aims to reach four overarching goals: 1.Attain high-quality, longer lives free of preventable disease, disability, injury, and premature death, 2. Achieve health equity, eliminate disparities, and improve the health of all groups 3.Create social and physical environments that promote good health for all. 4. Promote quality of life, healthy development, and healthy It is the number of true negatives divided by all of those who tested negative behaviors across all life stages.
18. **Determinants of Care-** The range of personal, social, economic, and environmental factors that influence health status are known as determinants of health.
19. **Risk analysis-** the characterization of the potential adverse health effects of human exposures to environmental hazards.
20. **Health disparities-** the difference in health statuses between various groups (populations).
21. **Sensitivity-** measures the proportion of actual positives that are correctly identified as such (e.g., the percentage of sick people who are correctly identified as having the condition)

22. **Specificity-** (also called the true negative rate) measures the proportion of actual negatives that are correctly identified as such (e.g., the percentage of healthy people who are correctly identified as not having the condition)

23. Positive Predictive Value- Positive predictive value is the probability that subjects with a positive screening test truly have the disease

24. Epidemiological Triangle- A traditional model of infectious disease causation, known as the Epidemiologic Triad is depicted in Figure 2. The triad consists of an external agent, a host and an environment in which host and agent are brought together, causing the disease to occur in the host.

1. The triad of any disease includes the host, agent, and environment. Environmental factors include factors such as individual's home, stress level, diet, and more. Genetics also plays a strong role in disease occurrence. Disease can be transmitted either directly or indirectly. Infected individuals can have outright symptoms or subclinical disease, making the transmission of the disease more difficult to detect.

25. Confounding (Variables)- A confounding variable is an “extra” variable that you didn’t account for. They can ruin an experiment and give you useless results. They can suggest there is correlation when in fact there isn’t. They can even introduce bias. That’s why it’s important to know what one is, and how to avoid getting them into your experiment in the first place.

26. Study Methods-

1. **Descriptive**-
    a. describes person place and time. Provided data for program planning, resource planning, and generates a hypothesis. Types include correlational studies, case reports and studies, and cross-sectional studies.
2. **Analytic-** consists of observational and experimental.
    a. Observational include case control and cohort.
3. **Experimental** includes random control trial (typically for new drug testing), field trial (conducted on those who have a high risk of obtained a disease), and community trial (research is conducted on an entire community or neighborhood). Test a hypothesis.

27. Rapid Cycle Improvement Models- Rapid-cycle improvement is a "quality improvement method that identifies, implements and measures changes made to improve a process or a system."1 Rapid-cycle improvement implies that changes are made and tested over periods of three or months or less, rather than the standard eight to twelve months. It consists of fours stages:

Plan: Identify an opportunity to improve and plan a change or test of how something works**.**

Do: Carry out the plan on a small number of patients. The test period may be as short as one day for small PDSA cycles.

Study: Examine the results. Did you achieve your goals?

Act: Use your results to make a decision, incorporate changes into your workflow, and establish future quality improvement plans

28. **Is screening a tertiary intervention? If yes, why, if not, what is it?**

No, it is secondary.

29. **How does a provider determine the usefulness, appropriateness, of a screening test?**

1. Screening and diagnostic tests are important, but are not always 100% accurate in confirming a diagnosis. How do we distinguish which tests are good to use? Even if a test identifies a disease, we must ask the following.
2. Is it valid?
    a. The **validity** of any screening test is the ability of that test to distinguish correctly who has a disease.
    b. Validity is based in both the specificity and sensitivity
        i. ***specificity*** (the ability of a test to correctly identify those who do not have the disease) and