Research Methods of the Health Sciences - SLP

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Author’s Note

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In the reformed health care system, the research methods to improve the scope of health sciences is imperative to broaden the research horizon. The research process is a foundation for making informed and effective decisions in order to improve the health standards. The application of right research methods assist in comprehensive view of the care and treatment designs. Research is an important tool in improving the health objectives by bringing about innovations in the medical treatment, remedies and preventions strategies. The empirical research in the field of health sciences is either a qualitative or quantitative research methodology. The research can be carried out on various features including health policies and health systems, demographics and epidemiology of communicable and non-communicable diseases, mother and child health, nutrition, social behavior and cultural and ethical values of patients in a cultural diverse health care system (Salazar, Crosby, & DiClemente, 2015). The development in the health sciences substantially lies on the application of efficient procedures, well-defined variables, analytical tools, validation testing while considering the ethical implications and limitations of the study.

**Data Collection Procedures**

Data collection procedures vary significantly, as it is entirely dependent on the type of research study being carried out. In order to conduct research including the health care motives, the data can be collected from the hospital records, staff interviews and handbooks, practitioner’s notes, observatory methods and referring to the previously published literature review. In carrying out a quantitative research, the sampling procedure lies on the statistical analysis and applying certain correlation tests. There might be some bias in the studies as the study does not depend on the theoretical assumptions. Such studies include multiple variables that might change according to the need of the study. The quantification of the empirical research can be achieved by the measurement of the variables, population estimation parameters and statistical testing. In qualitative research method, the sampling can be done by conducting opinion surveys, questionnaires, notes and interviews etc. The systematic review qualitative studies are carried out by analyzing the literature reviews and extracting the results by content analysis. However, quantitative studies are best used when it is required to support any arguments or proving any fact (McCusker & Gunaydin, 2015). During a research, data management is needed to accurately stated while comparing it with previous literature.

**Variables and Measurement**

Variables are the most important factors in a research study that can be measured or calculated in any case study for deducing specific results. Variables can be anything in order to determine the physical characteristics or the properties of any component or incident involved in the study. Different variables exhibit different outcomes under different circumstances and changes in the study conditions. Variables can either be dependent or independent and others can be discrete or continuous based on the clinical research trials and strategies. The experimental approach helps in manipulating or assigning the independent variables. The criteria for the evaluation of variables is defined on the basis of frequency of complications and by changing the extent of exposure and dose of the treatments. Variables also help in the randomization of the study as the distribution of extraneous variables among different groups. However, it is necessary to compare the distribution of variables in order to ensure the validity of the inferences that can be drawn from the study. An independent variable does not have any influence on any other variable while dependent variables have an effect on other factors that are used for the predictions and association studies. The correlation between the dependent and independent variables can be affected by the interventions and interceding strategies (WHO, 2001). Measuring the variables which are the precedent of any study or the outcome is more practicable in the experimental studies instead of analytical studies especially in the case control and cohort study designs.

**Data Analysis Procedures**

In contrast to the descriptive research methodologies, the analytical studies involve the hypothesis testing along with the comprehensive description of the population. The study that is being conducted will have a particular research hypothesis formulated on the basis of research objective and observations during the research. Thus, the inference of the study is a two steps procedure including the estimation of parameters that are relevant to the probability distribution and significant testing of the parameters. The statistical testing involves several steps that begin with identifying the null hypothesis which should be testable. Then decision on the validity of the hypothesis has to be dichotomous; wither to accept it or simply reject it therefore, two types of errors might occur during the inference of the hypothesis. Next step is determining the suitable statistical test for the said variables. Based on the variables and their distribution and prevalence the type of test will be selected; either a z-test or the chi square test. The tests are performed by comparing the values with the theoretical values and the hypotheses are either accepted or rejected on its basis. In the end, the power of the test is calculated by a P-value test for analyzing the significance of the results (Khan, n.d.).

**Study Validation and Ethics**

The validity of any test is the validation whether the results of the study are comparable to the initial hypothetical measurements. Two different types of validity are considered during a research study; internal and external. Internal validity refers to the effects of the study that either they are due to the manipulation of some independent variables. It is determined by the causal relationship among the dependent and independent variables. Threats to internal validity can be removed by controlling the extraneous variables and removing any investigator factors. External validity, on the other hand, refers to the extent to which the inference of any test can be generalized with ecological, population and historical validity. Threats to external validity can be removed by including random samples and removing bias (Lavrakas et al., 2019). The research studies conduct in any health care setting including the sensitive information of the patients and nurses via the electronic health records or continuity of care documents should be used within ethical limits. The consent of the patients, hospitals, health care providers and other individuals or organization involved in the study should be consulted before conducting the study.

**Study Limitations**

The study limitations should be identified before conducting and the study and after the study has been completed, the limitation are needed to be mentioned in the publications. It provides the insight for looking towards advanced or previously missed options and study gaps that can be addressed in the future research studies. A few of the study limitations might be unavailability of the advanced health care systems and costly data sampling.

**Conclusion**

The result compilation is an important part of the study,. It should be very comprehensive and descriptive. Some results might be represented in the tabular or graphical forms. The detailed discussion section should explain all the tests and their results while comparing them with the theoretical studies. The research article will be published in a renowned journal such as Health Education Research, Health Services Research or Journal of Public Health. The articles published in these journals will assist the future researchers to incorporate the findings of this study in their research.

**References**

Khan, S. (n.d.). Hypothesis testing and p-values (video). Retrieved November 10, 2019, from Khan Academy website: https://www.khanacademy.org/math/statistics-probability/significance-tests-one-sample/more-significance-testing-videos/v/hypothesis-testing-and-p-values

Lavrakas, P. J., Kennedy, C., de Leeuw, E. D., West, B. T., Holbrook, A. L., & Traugott, M. W. (2019). Probability Survey‐Based Experimentation and the Balancing of Internal and External Validity Concerns. *Experimental Methods in Survey Research: Techniques That Combine Random Sampling with Random Assignment*, 1–18.

McCusker, K., & Gunaydin, S. (2015). Research using qualitative, quantitative or mixed methods and choice based on the research. *Perfusion*, *30*(7), 537–542.

Salazar, L. F., Crosby, R. A., & DiClemente, R. J. (2015). *Research methods in health promotion*. John Wiley & Sons.

WHO. (2001). *HEALTH RESEARCH METHODOLOGY: A Guide for Training in Research Methods* (2nd ed.). Regional Office for the Western Pacific, Manila: World Health Organization.