

# Free essay on scientific foundations of health service research

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Research is an integral part in evaluating current practices in health services. This involves establishing facts in order to reach new conclusions through the use of scientific inquiry. There are several key characteristics in the process of scientific inquiry in health services research which improve health care services. These include positivism, scientific theory, empiricism, objectivity and ethical standards.

## **Positivism**

Positivism is based on the assumption that life exhibits regular patterns and not comprised of a collection of totally random events. Randomness does exist, but predictable patterns of regularity have been established through the research of natural phenomena. Laws of natural order have been established through study of the natural sciences. However, research in the social sciences such as human behavior and social phenomena can challenge the underlying premise of regularity.

## **Scientific Theory**

Scientific theory involves constructing a general explanation for an observed phenomenon or a hypothesis which can then be tested in a research setting. This is done using both deductive and inductive processes. The first step is to define the research topic by examining current knowledge and research. Second, the assumptions (things considered true but not yet tested) of the topic must be considered and pre-testing or pilot testing is often utilized before data collection begins. Third, the range of phenomena or scope of the study must be established. Questions such as how generalized or specific the findings of study will be must be considered. For example, what will be the

geographic scale (local vs. national) or the ethnic, racial or socio-economic groups represented? Specific populations are usually targeted because larger scale population studies make it more difficult to get a representative population sample.

Next, the major concepts and study variables must be considered.

Independent variables can change other variables and can be manipulated by the researcher (including the necessity of a control variable). Dependent variables can be affected by other variables but cannot change other variables. Fifth, a hypothesis can be constructed by predicting the relationships between the variables considered. A hypothesis must be testable and not include any judgments or values of the researcher.

Relationships between variables can be positive (independent and dependent variables vary in the same direction) or negative (inverse relationship between variables). Study variables can also exhibit more complicated relationships such as spurious (third variable has an impact on relationship of two other variables), intervening or suppressor variables.

Last, the theory is specified which establishes the framework of the study.

## **Empiricism, Objectivity & ethical standards**

Empiricism is an important part of the process of scientific inquiry. It is the theory of knowledge that a research question, or hypothesis, is able to be verified by either direct or indirect observation. Direct observation involves data collection in field studies whereas indirect observation is based on the use of surveys and interviews to test a research question. It is important not to use perception, tradition, common sense or intuition to test a hypothesis.

Philosophical questions are opinions and thus untestable under empiricism.

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It is important to also maintain objectivity in a study. There are several sources of bias which can influence the results. The values or opinions of a researcher can influence the assumptions, experimental design and methods of a study. The placebo effect (Hawthorne effect) must also be considered. This is a bias where participants in a study modify their behavior or feelings based on a perception of what effect a variable will have on them. This can also influence the researcher as well, so studies, when possible should be carried out “ double-blind” meaning neither the researcher or study participant know if they are in a test group or a control group. One further source of bias is the effect study outcomes will have on funding, status, publication potential, etc.

Ethical standards are also very important in the process of scientific inquiry. This includes informed consent for study participants so they are advised of all aspects of the study before participating. Also, standards of ethics have been established at multiple levels from the Institutional Review Board (IRB) at the institution where the research is to take place to international level review boards.

## **Characteristics of Health Services Research**

Using the process of scientific inquiry, health services research is unique in that it is multidisciplinary, population-based and utilizes applied research. It focuses on the health of populations not individuals. Health services research uses clinical, biomedical, environmental and epidemiological research.

Review of existing research is very important up front in order to devise a testable hypothesis and an effective research design. In addition, objectivity and ethics are very important. All of these factors ensure that health services

research produces effective results that will improve our health care systems.