

## Quantitative and Qualitative Methods in Medical Research

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Most researchers agree that the main general goals of research are description, understanding/explanation, and, from there, prediction. Numerous studies have been constructed into the field of research on human services, utilizing both quantitative and qualitative methodologies and, in some instances, a combination. In these notes I cast a brief look over the concepts of qualitative and quantitative research from a methodological perspective with the aim to encourage researchers to start employing a full range of instruments to explore and understand the phenomenon of interest.

Research methodology of qualitative research differs from that of quantitative studies.

Qualitative research is uniquely suited to address questions that might be difficult, if not impossible, to investigate under more structured quantitative research designs. For example, qualitative inquiry can effectively tackle sensitive issues such as domestic violence and sexual dysfunction, analyse populations of children, subcultures, and deviant groups. As a result, qualitative methods play a key role in social sciences. At the same time, application of qualitative approach in clinical studies can give us deeper understanding of object of investigation, especially when social or ethical aspects involved [1-3].

Because quantitative and qualitative research methods are based upon different ontological (concerning what reality is: objective and independent of the researcher versus multiple realities exist in any given situation) and epistemological (regarding the way we create knowledge: researcher remains distant and independent of what is being researched versus researcher interacts with those

he/she studies) assumptions [4], they have different methods to capture the perspectives of participants. Quantitative researchers rely on numerical values obtained from statistical procedures and their corresponding *p* values, whereas qualitative methods do not have independent and dependent variables, nor do they test a hypothesis or a treatment effect. Instead, qualitative researchers rely on excerpts from the actual voice of participants to describe and support the identified themes [5].

Being generally more flexible, design in qualitative analysis is also researcher-dependent. Qualitative researcher places themselves at the center of the process and, indeed, the researcher is the instrument by which information is collected. The closeness of the investigator to the research participants instills an in-depth understanding which can prove beneficial to a thorough analysis and interpretation of the outcomes; however, this intimacy requires a unique set of skills from the researcher like ability to build rapport with participants and collect and interpret data in an objective, unbiased manner [6].

Ethical issues exist in any type of research, and both quantitative and qualitative studies are not exceptions [5,7]. Most universities have ethical regulations and researchers should follow it to protect study participants, themselves and their institutions.

An important step in the research process is to gather datasets. Data collection methods in quantitative research differ from that in qualitative studies. Methods that can be used to collect quantitative data include randomized clinical trial, retrospective and prospective cohort and case-control studies, while the most commonly used ways of data collection in qualitative research

are questionnaires, focus groups and interviews [8]. It is crucially important that the data collection process should be matched to the stated study design and the purpose of the research in both approaches.

After the data is collected, researchers analyse it in order to provide evidence for the phenomenon under investigation. Quantitative researchers use numerical values and statistical procedures (both descriptive and inferential) to organise and interpret data. There are many variants of statistical analysis, to name descriptive statistics, bivariate and multivariate statistical tests among the common. One of the main concerns in quantitative research is the objectivity of the phenomenon being studied. To increase validity of the study and generalize study results to target population, research hypothesis is to be appropriately controlled, manipulated and tested. Qualitative researchers, by contrast, are more concerned about the subjectivity of the case being studied. As such, neither a particular formula nor a special rule used to analyse data. In qualitative analysis, the researcher focuses on meaning rather than measureable phenomena. They are not concerned about quantifying associations or seek cause and effect inferences. Instead, the focus is placed on capturing insight and understanding, which is grounded in participants' experiences and interpretations, in order to explore the underlying meanings of the findings obtained. Generally, when researchers have little knowledge about new phenomena or new meanings of the known phenomena, qualitative inquiry methods are the best for gaining a deeper understanding of the problem from the participant's perspective. According to the literature, there are different types of qualitative data analysis, and readily available online packages can speed up the data processing, especially when there is a large amount of variables.

To summarise, quantitative and qualitative research methods are equally important in medical research. Although methodology of qualitative studies differs from that of quantitative research, they should not be considered as contradictory; rather, they work as complementary elements in developing new knowledge for solving research problems. Importantly, both methods enable medical professionals to improve patient care which is the ultimate goal for conducting medical research.

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