NAME: Ojukwu Gift Tareh

Course code: PHA 406 (Research Methods and Research Ethics)

Department: Pharmacology & Therapeutics

Level: 400

Assignment

Explain the various research models and how they can be applied

**Answer**

A research model is simply a representation of key concepts, ideas, phenomenon or event (the target). In pharmacology, laboratory animals are usually the models or surrogates used to portray and study the effects of drugs and new chemical entities on humans. While the model may successfully imitate the target phenomenon, there may be slight differences and this usually affects the validity of a model. Scientists have therefore suggested considering the validity of any model whether in *vitro* or in *vivo* on a case-by-case basis.

Factors to consider in research model include:

1. Validity: the aim of research using animal models is to predict a response in humans therefore the validity of the model must be scrutinized and properly evaluated.
2. Specificity: models are highly specific. For instance, while strains of mice and rats which develop cancer, heart disease, diabetes or neurological disease could be of great interest in the study of these diseases, it would be foolhardy to consider these animals for regulatory toxicology where long-lived strains are usually required. Therefore, it is important to specify the context of a proposed study before laying claims to its invalidity.
3. Animal models could be improved through further research. Some of these investigations are aimed at understanding the animal as potential models for various disease conditions.
4. Models are not randomly found, they need to be developed and this requires in-depth understanding of the biology of the species and the effects of various interventions.
5. Models should be sensitive to the experimental treatments by responding well, with minimal variations among subjects treated alike.

Various research models and their application

1. Quantitative method: This method can simply be defined as a method that deals with numbers and measurable forms. Quantitative research model involves the gathering of numerical data that can be organized through statistical analysis. It is used in making generalizations. It can be applied in: questionnaires (which measure opinions as numerical data), experiments (such as field experiments, testing hypotheses in the laboratories), document screening (such as sourcing numerical data from financial reports), observation (such as the coding of observational data in order to translate it into numbers).
2. Qualitative method: This method deals with data collection using conversational methods. It is useful in the exploration of how or why things have occurred and interpreting events and describing actions. This research method is applicable in: interviews, focus groups, observations (such as on-site) and document analysis (such as interrogation of correspondence like letters, reports)
3. Mixed method: This method involves a combination of the quantitative and qualitative methods. It is a wholistic approach since it integrates statistical analysis with contextualized insights.