Planning a research in Plastic Surgery

An editorial

Summary

Background: Plastic Surgery is a rapidly developing field in clinical science. Much of what was impossible in the past has been made possible by the unravelling of "mysteries" through scientific discoveries in molecular biology and genetics. When these are applied to the art of reconstruction and enhancement of body image, what comes out is beauty with a major reduction of morbidity. This communication aims at encouraging the up and coming performers in the art of Plastic Surgery to combine the art with the science and get us to the next level.

Method: A brief overview of what is commonly taught on study designs as well as my experience in research will be applied to aspects of plastic surgery with the hope that colleagues will be challenged to spend more time on the bench and in the field to give us a clearer picture of what our practice involves and this will invariably translate to better care.

Key words: Clinical research, study designs, research question, research funding.

By the end of this paper, the reader should be able to:

- Describe the types of research embarked upon in the clinical sciences
- Discuss the stages of involvement in planning a research.
- Design a clinical research

I will commence by categorizing Clinical Research in a Clinical Science specialty like Plastic Surgery. Clinical research is a branch of medical science that determines the safety and effectiveness of treatment regimen including surgical procedures; appliances and diagnostic mechanisms intended for humans. Clinical research can be patient-oriented when it involves studies of mechanisms of human disease, of therapies or interventions for disease or studies to develop new technology that is related to disease. Clinical trial is a type of clinical research that is patient oriented which deals with drug investigation. Secondly, clinical research can be a form of epidemiological study. Some of the papers that have been published in this journal have been in this form and have been majorly retrospective studies of clinical records of patient that have been admitted to the hospital. These types of study try to examine the distribution of disease and factors that affect health.

Some case reports and case series are communication papers rather than real research articles. While few of them report major discoveries, most do not report something new and should not have been published in the first instance. I have therefore decided to provide guidance on research in the clinical sciences typified by Plastic Surgery rather than zero on clinical research. This is with the intention of providing a more global overview.

Research in the clinical sciences may be:

- Non-experimental or Observational
- Quasi-Experimental
- Experimental

The basis for classifying into any study design can be subject manipulation, randomization and or control. A non-experimental or observational study may be descriptive or analytical. Examples of each can be seen in the following organizational charts:

Most retrospective studies are descriptive and they are based on records for example in case notes or on other data. Prospective studies afford the researcher the opportunity of introducing his variables and also the opportunity of manipulating the independent variables to suit the study purpose. While descriptive statistics are normally utilized in descriptive studies, inferential statistics allow the researcher to make inferences on relationships between variables and determine the trend and patterns.

Quasi-experimental research design is one that shares many similarities with the traditional experimental (randomized controlled study), but specifically lacks the element of random assignment. They are used when randomization is impossible or impractical. Types of quasi-experimental design are:

- One-group pre-test, post-test
- Non equivalent control group design
- Case-control design

Different types of experimental study include:

- Simple experimental design
- Randomized blocked experiment
- Cross-over design

When a researcher describes and analyses researchable objects or situations but does not "intervene" he is said to have performed a non-interventional study. In interventional study, the researcher manipulates objects or situations and measures the outcome. Having dealt with the basics of research design, it is good to note that the most important part of a research is the choice of a research question.

Choosing a research question

The first step in the research process is identifying a research problem which leads to brainstorming to get research topic ideas. Origin of research ideas include[1]:

- personal clinical experience and inquisitiveness
- recognition of gaps when engaged in audit or guideline development
- reading the literature, where a stimulating editorial or a particularly arresting original paper immediately suggests further research
- involvement in policy development, when evaluation of new services or methods of working becomes particularly important.

As a senior resident, I did not get my research started early enough until when I received the stimulus from a mentor who was appointed to supervise the work of our unit. When I started to peruse the literature in what was then the British Journal of Plastic Surgery, I stumbled across an article on lip anthropometry by Stranc and Fogel which aroused my interest in that subject. The gap in their research provided an opportunity for me to start work on lip dimensions in Nigerian children which became the topic of my dissertation for the National Postgraduate Medical College[2]. In choosing a topic and getting your question right you must be specific and not overgeneralize and the topic must be narrow and focused enough to be interesting, yet broad enough to obtain enough information[3].

Shortly afterwards while still a senior resident, the gap in the knowledge of keloids gave me the inquisitiveness to research or confirm the "auto-immunity to sebum" theory of keloid pathogenesis. I embarked on a small sample controlled analytical (cross-sectional) study[4] utilizing medical students and some members of my extended family. The study was published about five years after the experiment was performed.

After brain-storming, and reading general background information on the subject, the next thing is to focus on the topic. Any topic will be difficult to research if it is too broad or too narrow. Fine tuning may be performed by using the traditional media reporters' method of

"Who?-What?-Where?-When?-Why?" For example, when you do not focus on "Where is it happening?" you tend to generalize the topic so that instead of writing on the pattern of burn injury at Ibadan, which is where you based your study and from where your data was collected, you generalize to the pattern of burn injury in Nigeria or in Africa.

The next point is to identify key concepts. This will assist in the choice of your keywords and in literature search especially in the search for ideas for conceptual framework. A look at the following table will give you an idea of what I am trying to indicate:

Research Idea	*Concept 1*	*Concept 2*	*Concept 3*
I want to know about body image.	body image		
Is body image relevant to satisfaction after cosmetic surgery?	body image	cosmetic surgery	
To what extent do residents know that body image is relevant to satisfaction after cosmetic surgery?	body image	cosmetic surgery	residents

Next, restate your topic as a focused research question. Example: if your topic was in line with the foregoing, a possible research question could be: "Does the perception of body image influence the outcome of cosmetic surgery: a resident doctors' perspective at Ibadan". On obtaining a focused research question, read more about the topic. Nowadays, the internet is just a click away. In those days it was not that easy to retrieve literature. After perusing the literature, formulate a thesis statement. Write your topic as a thesis statement. The thesis statement is usually one or two sentences that state precisely what will be proved or answered. The thesis statement or hypothesis will assist you in the decision on your method of statistical analysis.

Develop a proposal and obtain an ethical approval

The next thing after formulating a question is to develop a proposal to describe the basic details of the study. This may be used when discussing the study with potential partners and sponsors. Such must contain a good introduction or background to the study, justification/significance of study as well as methods inclusive of details of methods of statistical analysis. After developing the proposal, you should liaise with potential study partners. In doing this, potential issues will be identified at an early stage. Current trend in research is multi-disciplinary studies either within same institution or multi-centre. Different specialists collaborate to view different aspects of a subject. Once initial discussions are complete, there will be a need to formalize relationships via a contract. Contracts of multi-centre and international studies may only be signed by authorized signatories at the Hospital or University.

All clinical studies require a favourable opinion from the Research Ethics Committee. The Principal Investigator is responsible for obtaining ethics approval. The request for ethical approval should be made early and should contain in addition to the initial proposal, a consent form for participants that should comprise the following details:

- What is the purpose of this research study?
- Will I find out the results of this research study?
- How many other people do you think will participate?
- Is participation voluntary and how long will my participation in this study last?
- What are the costs to me for participating in this study?
- What types of risk are involved if I choose to participate?
- How will my personal information be protected?
- What are the benefits of participating in this study?
- What happens to the sample if I withdraw from the study?

Fundability and publishability

The ultimate goal of research in the clinical sciences is improvement of health care. Reaching this goal will be enhanced when the researcher's work is both funded and published. In considering fundability, the intellectual content as well as the presentation should be above average. The level of research interest in the topic must be aroused among the several funding agents that are spread all over the world. Each country has a central funding agency whose websites can be googled. In Nigeria, ETF is an example that can be sought by those in academia. In UK and Europe, the NHIS and Edulink while in the USA, NIH and MacArthur funding is considered annually. UNESCO, WHO as well as big pharmaceuticals have different areas of interest that can be logged into. It is important to note that only research that is relevant to current clinical challenges and government policy and of interest to a funding agency are likely to receive funding.

In considering whether the paper may be published or not, the researcher should be able to provide an affirmative answer to the 'who cares?' and the 'so what?' test[1,5]. The 'who cares?' test involves presenting the idea to colleagues for their reaction to its relevance. Candid responses at this stage, particularly if the question fails the test, can save much disappointment at a later stage. The 'so what?' test involves due consideration of the implications of the research when completed. Clinically or policy-relevant, well-conducted research will usually find a home in the literature[1]

Conclusion

It is my hope that this paper will encourage the up and coming performers in the art of Plastic Surgery to combine the art with the science and get us to the next level. Research should be incorporated in the day to day practice and I am of the belief that it does not cost much more.

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