CMED 236

Research Methods

Lecture 1: Introduction To Research Methods

By Linet Angwa

Lecture Outline

1. Objective
2. Definition
3. Relationship between methodology and methods
4. Origin of research
5. Research Objectives
6. Motivating factors for research
7. Significance for research

1. Purpose for research
2. Criteria of a good research
3. Qualities of a good research
4. Ethical considerations in research

OBJECTIVES

- Define basic terms.
- Identify factors that motivate people to carry out research.
- Identify sources of research knowledge.
- State purpose of research.
- Discuss qualities of a good research.
- Discuss the ethical considerations in research

DEFINITION

- Research is an organised, systematic, data-based critical scientific inquiry or investigation into a specific problem, undertaken with the objective of finding answers or solutions to it.

Which of these can be classified as research?

1. Nyambura prepared a paper on “Sanitary towel usage in secondary schools” after reviewing literature on the subject available in his university library and called it a piece of research.
2. Joy Amunga says that he has researched and completed a document which gives information about the age of his students, their CAT results, their parents income and distance of their schools from the District Office.

3. Everlyne Kerubo participated in a workshop on curriculum development and prepared what he calls, a research report on the curriculum for building technicians. He did this through a literature survey on the subject and by discussing with the participants of the workshop.

Consider the following case which is an example of research:

- A general manager of a car producing company was concerned with the complaints received from the car users that the car they produce have some problems with rating sound at the dash board and the rear passenger seat after few thousand kilometers of driving.

- He obtained information from the company workers to identify the various factors influencing the problem.
- He then formulated the problem and generated guesses (hypotheses).
- He constructed a checklist and obtained requisite information from a representative sample of cars.
- He analyzed the collected data, interpreted the results in the light of his hypotheses and reached conclusions.

- Notice in the example above that the researcher went through:

i. A sequence of steps which were in order and thus systematic.

ii. Secondly, the researcher used a scientific method of inquiry in reaching at conclusions.

- The two important characteristics of research are: it is systematic and secondly it follows a scientific method of enquiry.

Relationship between Methodology and Method

- **Methodology** is the general research strategy that outlines the way in which a research project is to be undertaken and, among other things, identifies the methods to be used in it.
- These **Methods**, described in the methodology, define the means or modes of data collection or, sometimes, how a specific result is to be calculated.
- A methodology is the design process for carrying out research or the development of a procedure and is not in itself an instrument, or method, or procedure for doing things.

ORIGIN OF RESEARCH

- The origin of the knowledge that forms the foundation of the study may arise from a number of situations such as:
- ✓Personal experience.
- ✓Observation.
- ✓Conclusion and recommendations from other studies.
- ✓Reading of texts and
- ✓New events.

RESEARCH OBJECTVES

- The major aim of any type of research is to find out the reality and facts which is unknown and which has not been exposed.
- Although each research activity has its own particular reason, the objectives of research can be grouped into the following categories :

1. To gain familiarity with a phenomenon or to achieve new insights into it (studies with this object in view are termed as *exploratory* or *formulative* research studies);
2. To portray accurately the characteristics of a particular individual, situation or a group (studies with this object in view are known as *descriptive* research studies);

3. To determine the frequency with which something occurs or with which it is associated with something else (studies with this object in view are known as *diagnostic* research studies);
4. To test a hypothesis of a causal relationship between variables (such studies are known as *hypothesis-testing* research studies).

MOTIVATING FACTORS FOR RESEARCH

Motivating factors include:

- Get research degree along with its consequential benefits such as improved CV and knowledge.
- Face challenges in solving unsolved problems e.g. search for AIDS cure, anti-malarial agents.
- Get intellectual joy of doing some work.
- Service to the society.

- Get respectability.
- Government directives.
- Employment conditions.
- Curiosity about new things.
- Desire to understand causal relationships, social thinking and awakening.

SIGNIFICANCE OF RESEARCH

1. Inculcates scientific and inductive thinking and promotes development of logical habits of thinking and organization (think of the Kenyan politicians; do they behave in a manner suggesting that they are research oriented?).
2. Provides the basis for policy formation by various government departments (e.g. budgetary allocation, building of schools and hospitals, employment of government servants. Do you think the government does these tasks with a sound research base?).

3. Improvement of professionalism (provides information to improve various aspects of professionalism – media surveys, evaluation, and performance contracts by the Kenya government).
4. Facilitates decision making (Does this happen in Kenya? Recall the Kenya Ports Authority [KPA] saga – Minister Makwere - Mr Ondego - and the President; employment of health workers by the Ministry of Health).

5. Solving operational and planning problems in business and industry (have you ever seen banking institutions asking their clients about the quality of service?).
6. Study social relationships and in seeking answers to various social problems (think of crime, rape, FGM and tribalism in Kenya).

PURPOSE OF RESEARCH

- Review or synthesize existing knowledge
- Investigate existing situations or problems
- Provide solutions to problems
- Explore and analyse more general issues
- Construct or create new procedures or systems
- Explain new phenomenon
- Generate new knowledge

…or a combination of any of the above!

- Research serves many purposes. Three of the most common and useful purposes, however, are;
  - ✓ exploration,
  - ✓ description, and
  - ✓ explanation.
- Many studies can and often do have more than one of these purposes, however each have different implications for other aspects of research design.

CRITERIA OF A GOOD RESEARCH

Scientific research has to satisfy the following criteria: -

1. Clearly defined purpose of the research and use of common concepts.
2. Research procedure should be described in sufficient detail to allow another researcher to repeat the research for further advancement, keeping continuity of what has already been attained.

3. Procedural design of the research should be carefully planned to yield results that are as objective as possible.
4. Researcher should report with complete frankness, flaws in procedural design and estimate their effects upon the findings.
5. Analysis of data should be sufficiently adequate to reveal its significance and the methods of analysis used should be appropriate. The validity and reliability of the data should be checked carefully.

6. Conclusions should be confined to those justified by the data of the research and limited to those for which the data provide an adequate basis.

- Greater confidence in research is warranted if the researcher is experienced, has good reputation in research and is a person of integrity.

QUALITIES OF A GOOD RESEARCH

a) Good research is **logical:**

- Guided by rules of logical reasoning.
- Logical process of induction and deduction are of great value in carrying out research.

✓Induction – process of reasoning from a part to the whole.

✓Deduction – process of reasoning from some premise to a conclusion.

- Logical reasoning makes research more meaningful in content of decision making.

b) Good research is **systematic:**

- Structured with specific steps to be taken in a specified sequence in accordance with the well-defined set of rules.
- Does not rule out creative thinking but rejects use of guessing and intuition in arriving at conclusions.

c) Good research is **empirical:**

- It implies that research is related basically to one or more aspects of real situation and deals with concrete data that provides a basis for external validity to research results.

d) Research is **replicable:**

- This characteristic allows research results to be verified by explicating the study and thereby building a sound basis for decisions.

Originality/ Novelty

ii Contribution to knowledge

iii Significance

iv Technical soundness

v. Critical assessment of existing work

ETHICS IN RESEARCH

ETHICS IN RESEARCH

Outline of Presentation

Def.– Ethics, Bio-ethics,

Pre-requisites to conducting Research.

Three main areas of focus namely:

~Ethical issues related to the researcher.

~Ethical issues concerning research subjects,

~Ethical issues concerning the research process.

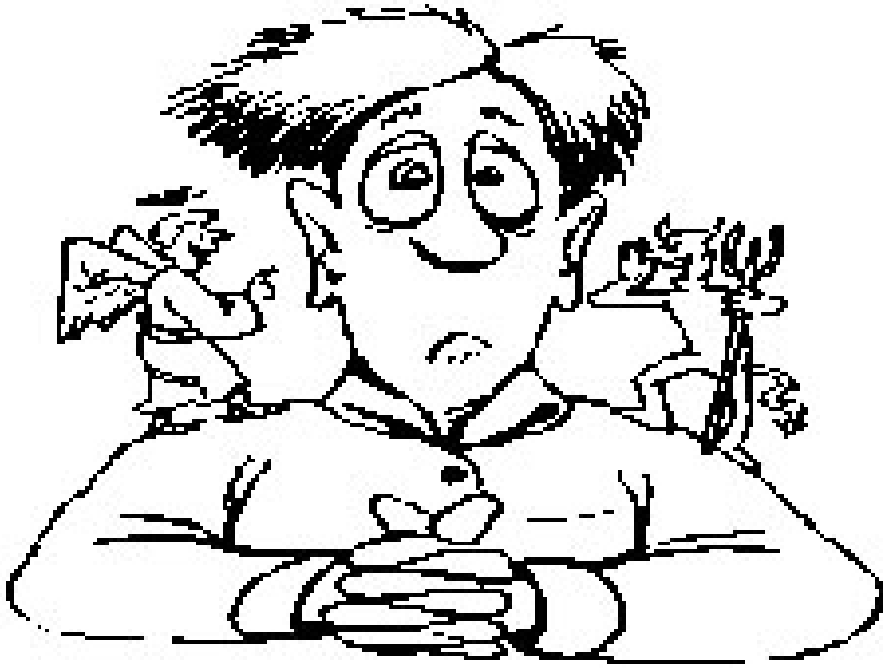
Ethical Issues

Justification for the research

Access to participants/Privacy

Informed consent

Potential harm



Outline of Presentation Cont…

Ethical issues related to the researcher

- Ethical issues relating to individual researcher
- Research Plagiarism and Fraud
- Misuse of Privileges

Ethical issues concerning research subjects

- Confidentiality and Privacy
- Anonymity

- Physical and Psychological Harm
- Voluntary and informed consent
- Use of vulnerable and/or special populations
- Financial issues and Sponsored Research
- Dissemination of Findings
- Academic Freedom

Outline of Presentation Cont..

Ethical issues concerning the research process

- Ignoring Pertinent issues in Research
- Ethical Issues in Experimental Designs
- Use of Tests in Research

ETHICS IN RESEARCH

Ethics. Ethics is defined as that branch of philosophy which deals with one's conduct and serves as a guide to one's behaviour.

Bioethics. Bioethics is the philosophical study of the ethical controversies brought about by advances in biology and medicine.

Pre-requisites to conducting Research:

- ✓Before carrying out data collection, one must seek consent from the relevant authorities, individuals and community in which the project is to be carried out.
- ✓This may simply involve organizing meetings at national, provincial or district level for sensitization purposes. However, for some studies, this may also involve obtaining written informed consent.

- ✓This is called permission to proceed. Most likely the principal investigator will be responsible for obtaining permission at the various levels.
- ✓The Health Research Unit in the Ministry of Health or the Institution organizing the research may assist in obtaining permission at the national level.

There are three main areas of focus namely:

1. Ethical issues related to the researcher.
2. Ethical issues concerning research subjects, and
3. Ethical issues concerning the research process.

ETHICAL ISSUES RELATED TO RESEARCHER

Ethical issues Relating to Individual Researcher

- ✓Since researchers are people genuinely concerned about other peoples' quality of life, they must be people of integrity who will not undertake research for personal gain or research that will have a negative effect on others.
- ✓Other reasons for being completely ethical is that there are laws which prohibit unethical behaviour and researchers could be faced with extremely humiliating situations if such laws are ignored.

Plagiarism

Plagiarism—using the ideas, writings, and drawings of others as your own without acknowledging the author

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PLAGIARISM

- Plagiarism is dishonesty.
- The research may be excellent but it wasn't done by the author of the paper.
- No point in trying to plagiarise published work.
- Plagiarism mostly involves unpublished theses.
- Difficult to detect unless editor/referee familiar with unpublished work in subject as well as published work.
- Sanctions seen as a default option now.

Fabrication and Falsification (Fraud)

Fabrication and falsification—making up or altering data

- ✓Prominent Cases in Kinesiology-related Research
  - Eric Poehlman – exercise physiologist at University of Vermont and University of Montreal
  - http://en.wikipedia.org/wiki/Eric_Poehlman

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Misuse of Privileges

- ✓A researcher has some power over the subjects owing to the training they have, their expertise, their legal authority to undertake research, and their perceived ability to provide help, especially in Africa where the poverty level is very high.
- ✓Research subjects therefore participate in research on trust. It would be extremely unethical for researchers to abuse this trust by using their power negatively, e.g.

- it would be unethical for a doctor researcher to undertake certain research tests on the pretext of providing treatment.
- It would be wrong for a researcher to use the collected data to get somebody into trouble or to stigmatize them.

ETHICAL ISSUES CONCERNING RESEARCH SUBJECTS

- Research involving **human subjects** in the Medical, Social and Behavioral Sciences poses complex ethical issues.
- It requires careful thought and consideration on the part of both researchers and research participants.

- Prospective participants must be given adequate information on both the possible risks and the potential benefits of their involvement to allow them to make informed decisions

Confidentiality and Privacy

- ✓ Respondents should be protected by keeping the information given confidential, especially if confidentiality has been promised.
- ✓ If one has to release information about respondents, their consent must be sought before releasing any information.
- ✓ Lack of confidentiality and mishandling information provided may cause respondents physical or even psychological harm, e.g. releasing the names of people who are bankrupt may stigmatize them and cause them to lose credit facilities which would be disadvantageous to them.

Anonymity

- This refers to the identity of individuals being protected either by using numbers, third parties or pseudo names.
- A researcher could disclose information about a particular individual but protect the identity and privacy of that individual, thus a respondent's name is not disclosed.
- At times it is not necessary to keep names anonymous if there is going to be follow-up, especially on longitudinal studies.

- On the other hand, when some sensitive information is being sought, e.g. details of sexual behaviour, it is wise to keep the respondent's identity anonymous in order to get more honest responses.
- When anonymity is required yet there is need for follow up, an individual code should be put on the questionnaire. The researcher is then able to link the code to the name in order to do a follow-up.

- ✓Though this method is not completely anonymous, it may allay some fears on the part of respondents.
- ❖The important thing is for the researcher to be honest.
- ❖ If confidentiality and anonymity are promised, then they must be assured.

Physical and Psychological Harm

- A researcher should never undertake research that may cause physical or psychological harm.
- A researcher should do all the preliminary tests and obtain all the background information in an effort to avoid impacting any harm to subjects.
- In social science research, psychological harm is more likely to occur than physical harm.

- ✓Psychological harm can be caused by asking embarrassing questions, expressing shock or disgust while collecting data, using threatening statements or compelling people to say something that they don't believe in or causing fear and anxiety among respondents.
- ❖Any action or statement which lowers a subject's self-esteem or self worth is also considered unethical and should always be avoided.

- Another form of psychologically harmful action may be to force respondents to recall unpleasant occurrences against their will, thus creating discomfort and resentment.

Voluntary and informed consent

- A researcher must conform to the principle of voluntary consent where the respondents willingly participate in research.
- Unethical behaviour would occur if the researcher failed to disclose the real purpose of the research fearing the subject's refusal to participate.

Example:

- ✓ It is unethical for a researcher to get people to participate in a piece of research regarding the unavailability of health services by falsely promising them health facilities after the research.

- In social research, permission to undertake research from a participant may not be adequate. It is unethical to get permission from a subject if that permission is based on deception as regards the reasons for undertaking research or the intended use of research findings.
- A subject must be told the truth and be given all the facts about the research in order to make an informed decision about participating or not. Informed consent should be based on information regarding:

- ✓The purpose of the research study
- ✓Any foreseen risks
- ✓A guarantee of anonymity and confidentiality
- ✓Identification of the researcher
- ✓An indication of the number of subjects involved
- ✓Benefits and compensation or lack of them

The process of obtaining consent

1. Identify participant population
2. Produce information sheet and consent document
3. Obtain permission from school's ethics committee
4. Present research information to participant and discuss its contents – indicating that withdrawal at any time is possible
5. Answer participants questions
6. Give a copy of the consent document
7. Allow the participant time to consider

8. Meet participant and discuss documents, to answer any more questions and assess participants understanding
9. Obtain appropriate signed consent
10. Start research

Use of vulnerable and/or special populations

- It is extremely unethical if populations which are disadvantaged in one way or another are used without their consent or the consent of a guardian.
- Such special populations include;
  - ✓children,
  - ✓mentally disabled people,
  - ✓sick people,

- ✓ the poor and
- ✓ others with special needs like street children.
- ❖ Permission from those who care for those special populations must be sought and must be based on the principle of informed consent.

Financial issues and Sponsored Research

- In some cases, a sponsor of a particular research may demand some compromises on quality of research to save money or time, while some unprofessional sponsors of research may demand that the findings be reported in a distorted manner for their own selfish reasons, to which some researchers have fallen prey to such sponsors because of money and considerations of promotion.

- An ethical researcher should not accept such compromise in order to protect his or her integrity.
- Another aspect of finances that result in unethical conduct is when researchers divert research funds for other purposes. This affects the quality of research and may also yield misleading data.
- A good researcher should derive satisfaction from a good piece of research done honestly and legally.

Conflicts of Interest

"A situation in which an individual has one or more significant financial interest that have the potential for tainting . . . the conduct or reporting of the work conducted under a sponsored project."

http://orc.missouristate.edu/89845.htm

Dissemination of Findings

- It is unethical to conceal research findings after completion of research.
- Some researchers may decide not to reveal findings if they are contrary to their expectations, or their sponsor's expectations, e.g.
  - ✓ a researcher may fail to reveal research findings if they are likely to affect certain policies negatively, or
  - ✓ an institution may want to keep the results if such results are likely to bring about protests.

- If findings are sensitive, modalities of releasing them should be agreed upon rather than shelving the findings completely.
- In addition to being unethical, it is a waste of resources (time, money and energy) to undertake research only to conceal findings.
- Other ethical issues are related to publication of research findings. Every researcher should be aware of intellectual property rights, e.g.

- ✓if a research was done jointly by a team of researchers, it would be unethical for any participant then to publish the study as a personal effort without consulting the other team members.
- ✓The issue of first and second authors should be thoroughly discussed so that everybody's intellectual contribution is fairly recognized.

Academic Freedom

- This is the existence of an open and unrestricted atmosphere for free exchange of ideas and information.
- Academic freedom is very important in research because the researcher must be free to discuss and publish findings without fear of intimidation, losing jobs or being victimized.
- Researchers should be sensitized about their rights to academic freedom and on issues of intellectual property.

ETHICAL ISSUES CONCERNING THE RESEARCH PROCESS

Ignoring Pertinent issues in Research

- One of the methodological issues that has been debated in relation to ethics is the choice of topic.
- Many experts consider it unethical to purposely avoid a pertinent research issue for fear of repercussions or because of conflict of interest.
- A researcher is expected to be honest in search of genuine research problems and should exercise academic freedom to discuss any findings.

Ethical Issues in Experimental Designs

- In experimental designs, where control and treatment groups are used to provide meaningful comparisons, some experts have seen the differential treatment among both groups as unfair and unethical.
- In experimental studies, the treatment interventions, e.g. training, provision of medicine, etc.. are given to the experimental group and not the control group.

- The reason is that the researcher would like to see the effect of the intervention by comparing the experimental group (which got the treatment) and the control group (which did not get the treatment).
- One way of resolving this dilemma is by providing the same treatment to the control group after the study. If resources cannot allow this, candid explanation of the research to the control group may help reduce the feeling of unfairness.

Use of Tests in Research

- Because of the school systems which emphasizes examinations and competition in many countries, a lot of people become very anxious during tests or any kind of examinations with some experts arguing that subjecting respondents to tests is unethical due to discomfort and anxiety experienced.
- It is the responsibility of the researcher to pick a data collection method that is fairly free of anxiety.

- If tests are the most preferred method, the researcher should make every effort to put the respondents at ease by providing relevant information and reassuring them.

SUMMARY

Ethics. Ethics is defined as that branch of philosophy which deals with one's conduct and serves as a guide to one's behaviour.

~ is a way of understanding and examining what is "right" and what is "wrong"

Bioethics. Bioethics is the philosophical study of the ethical controversies brought about by advances in biology and medicine.

~ is a way of understanding and examining what is "right" and what is "wrong" in biomedical research and practice.

What are ethics?

Societal norms adopted by a group

- A conception of conduct that is right or wrong

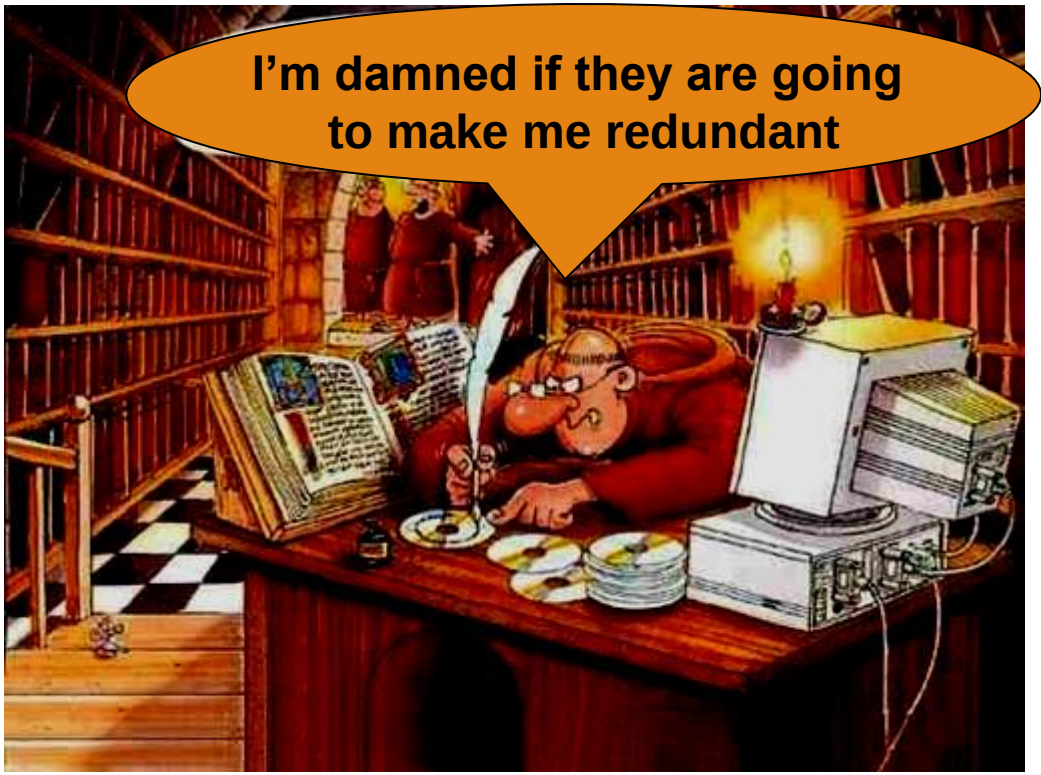
Deal with fundamental human relationships

Are a universal human trait

The Impact of Research on Values and Values on Research

- Ethical considerations are to the fore with the development of new technologies and new social systems

- Society is inherently conservative and seeks to set the limits of research activity



The scope of research ethics

- Ethical considerations cover all aspect of research but they are fore-grounded when the subject of the research are humans or animals

Ethical Principles – What are they?

Guides to moral behaviour

- Good: honesty, keeping promises, helping others, respective rights of others
- Bad: lying, stealing, deceiving, harming others

Universality of ethical principles: should apply in the same manner in all countries, cultures, communities

Relativity of ethical principles: vary from country to country, community to community

Ethical Principles Guiding Research

Respect for human dignity

Respect for free and informed consent

Respect for vulnerable persons

Respect for privacy and confidentiality

Respect for justice and inclusiveness

Balancing harms and benefits

Minimizing harm

Maximizing benefit

Figure 1: CONSENT TO SERVE AS A SUBJECT IN RESEARCH

I consent to serve as a subject in the research investigation entitled:_____

The nature and general purpose of the research procedure and the known risks involved have been explained to me by _____. The investigator is authorised to proceed on the understanding that I may terminate my service as a subject at any time I so desire.

I understand the known risks are:_____

_____

I understand also that it is not possible to identify all potential risks in an experimental procedure, and I believe that reasonable safeguards have been taken to minimize both the known and the potentially unknown risks.

Witness_____ Signed_____(subject)

Date_____

To be retained by the principal investigator.

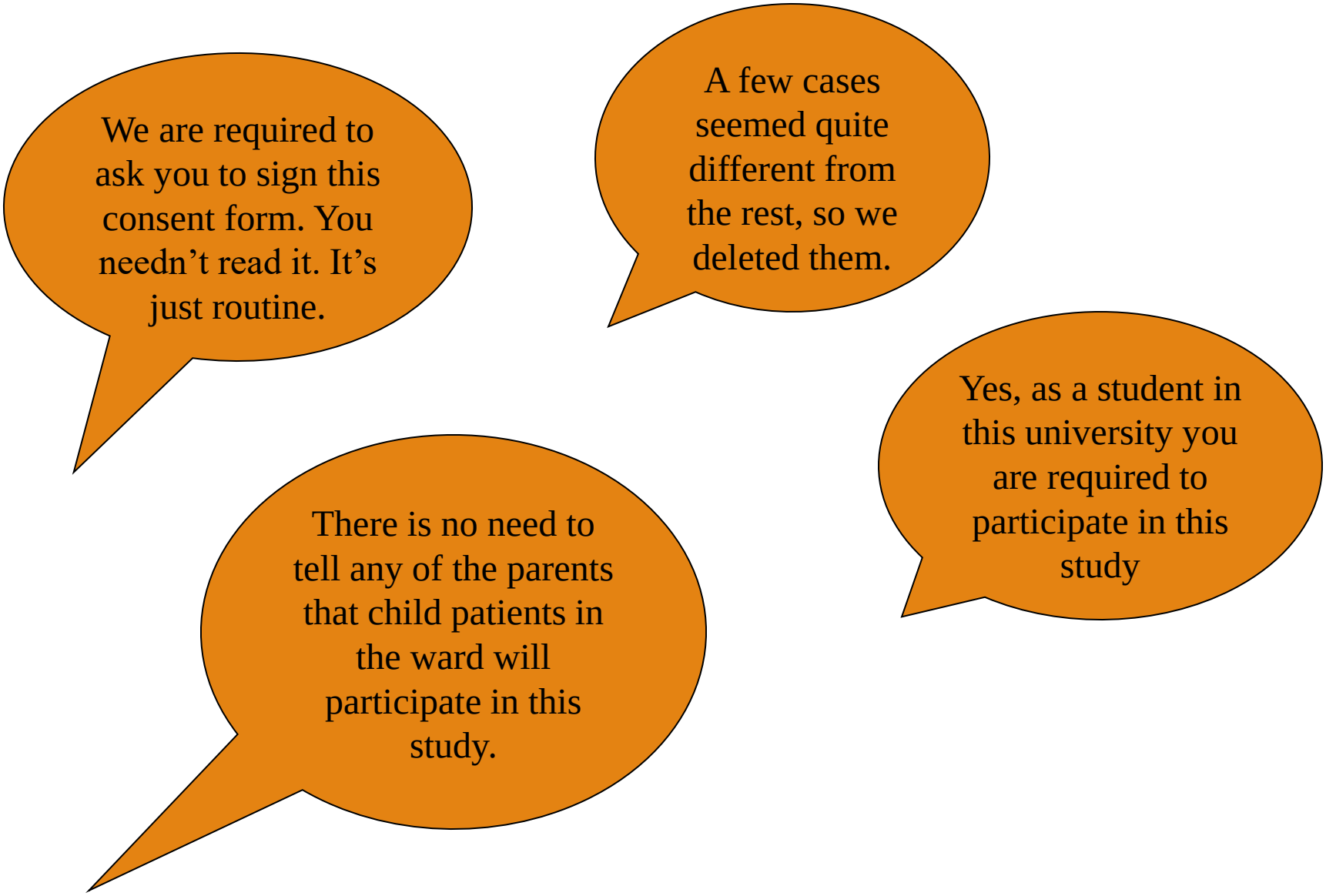


Figure 1: Examples of ……. research practices

Activity: Ethics and research

1. My research question is:_____

2. The possibility of harm to participants (if any) are as follows:
_____

- I would handle these problems as follows: _____
- _____

3. The possibilities of confidentiality (if any) are as follows: _____
I would handle these problems as follows: _____
_____

4. The possibilities of problems of deception (if any) are as follows:_____
I would handle these problems as follows:_____
_____

5. If you think your proposed study would fit the guidelines for exempt status, state why. _____

The Role of Bioethics committees

IMPORTANCE OF ETHICS IN RESEARCH

Human participants in research may be harmed

- Protection and safeguards needed to prevent harm
- Not all risks can be predicted in advance
- Harms may outweigh benefits

IMPORTANCE OF BIO-ETHICS IN RESEARCH

Human participants may be wronged

- To treat people as a mere “means” or “objects” to benefit others wrongs them
- Individuals possess human rights

Research produces benefits

- Access to research may provide benefits to the participants that are otherwise unavailable
- Health benefits to society result form research

IMPORTANCE OF BIO-ETHICS IN RESEARCH

Abuses in research have occurred in the past

- Tuskegee: poor African-American men observed , deceived and untreated for syphilis
- Contraceptive research with a placebo arm in Puerto Rico without consent
- Nazi era where many experiments were conducted without their knowledge
- Widespread agreement on the past abuses

Fundamental ethics Principles for research

RESPECT FOR PERSONS: an expression of ethical principle that people should not be treated as “mere means” to the ends of others

- Mandates obtaining informed consent form each individual to be enrolled
- Consent must be voluntary – not coerced
- Participants must be free to withdraw at will
- Privacy should be respected
- Confidentiality must be protected

Fundamental ethics Principles for research

BENEFICENCE

- Maximize expected benefits (to participants and others) minimizing potential harms, including psychological and social harms
- Ensure that research design is adequate to derive benefits from results

DISTRIBUTIVE JUSTICE

- Benefits and burdens of research should be distributed fairly among all social and economic classes, ethnic and racial groups in society

Fundamental ethics Principles for research

Universality ethical principles

- Principles are universal, but mechanisms and procedures for applying them may vary
- People everywhere deserve to be treated with respect
- Rights of research subjects are independent of political, civil or economic rights granted by the governments
- Research today is an international enterprise
- International guidelines: Declaration of Helsinki, CIOMS International Ethics Guidelines

Names of the committees

Ethics and Research committee (ERC)

Institutional Review Board (IRB)

National Review Board (NRB)

Research Ethics Committee (REC)

NEED FOR ETHICAL REVIEW COMMITTEES

- To ensure ***independence*** of ethical review of proposed research
- To strive for *impartiality* in judging the merits and shortcoming of proposed research
- To obtain an assessment of features of proposed research by laypersons, ethicists, non scientific experts as well as by scientists

Mandate of IRB

- Approve, request for approve of modifications or disapprove all human research activities
- Conduct continuing review of research not less than once a year and require progress reports from study investigators
- Oversee the conduct of research including observation of consent process

Mandate of IRB

- Place restrictions on a study
- ✓Suspend or terminate IRB approval of research that is not being conducted in accordance with IRB's requirements or that has been associated with unexpected serious harm to the subjects or any anticipated research activities involving risks to human subjects and others

Roles and functions of the ERB/ERC

- To apply ethical principles to research protocols under review
  - To determine that risks are reasonable in light of anticipated benefits (**beneficence**)
  - To ensure that the process and documentation of informed consent are ethically acceptable (**respect for persons**)

- To ensure that recruitment practices are noncoercive and respect the privacy and confidentiality of potential participants **(respect for persons)**
- **To seek to** ensure equity in the selection of research participants (**justice)**

Roles and functions of the ERB/ERC

- To ensure that research complies with national laws, and international guidelines governing research involving human participants : ethical and many times scientific issues
- To monitor research already in progress
  - Adverse events reporting
  - Consent monitoring

Roles and functions of the ERB/ERC

- To develop policies governing specific aspects of research at institutional, local or national levels
  - Institutional –KNH/ERC/ local ERB- hospitals
  - Nationally- National Council for Science and Technology (NCST)
  - Kenya Medical Research Institute- institutions without ERBs

ADDITIONAL SAFEGUARDS AND PROCEDURES IN RESEARCH

- A process of community consultation and involvement should be developed
  - Entire community should be educated about the proposed studies in addition to informing participants
  - A process of community consultation should be developed and maintained throughout the research
  - Results of research following completion should be conveyed to the community

- Support groups, supportive services, and health advocates should be made available
- Capacity building in participating institutions

- Protection of Vulnerable and special groups
  - Prisoners
  - Pregnant women or nursing mothers
  - Children
  - Poor people
  - Illiterate
  - Others

Compensation of research subjects

CIOMS guidelines on compensation

Types of compensation

- Accidental injury
- Equitable compensation
- Obligation of sponsor to pay
- ERB must ensure that the participants are aware of this and never waive this right to be compensated
- Part of consenting process

ACCREDITATED INSTITUTIONAL REVIEW COMMITTEES (IERC)IN KENYA

1. Kenya Medical Research Institute
2. KNH-UON-ERC
3. Kenyatta University
4. Kenya Methodist University
5. Moi University /Moi Teaching and Referral Hospital
6. ICIPE
7. Pwani University College

8. AMREF
9. Aga Khan University Hospital
10. Institute of Primate Research
11. Gertrudes Children’s Hospital
12. Egerton University Ethics Review Committee
13. Maseno University
14. Kabarak University

THANK YOU!