**2nd part of the lecture**

The aim

The aims of the project should be explicitly stated. These should be confined to the intention of the project and they should arise from the literature review.

Ex : the prevalence and calcification the submerged cases in to different level to be able to early diagnosis

Hypothesis:

A hypothesis is the supposed relation between variables. The hypothesis that you are trying to prove should be stated in the simplest form possible. It is general practice that hypotheses are stated in the null form, because they have their basis in inferential statistics. You challenge the hypothesis of no difference. The result of statistical testing gives the probability that the hypothesis of no difference is true.

Ex : the prevalence of submerged In Jordan population is resemble the one for concision (null hypothesis) .

The designe :

The type of study I could do is screening

Ex : screen a reports from 10 years ago (retrospective study )

 Screen for # of school (prospective study )….. >better

Ex : I go to The Ministry of Education and ask of the total # of school in Amman and then I pick randomly 1-2 school from each group of school that represent cretin area and pick randomly some spacemen from each grade. If I don’t has enough founding I go for retrospective study and choose complete record for pt from age 8-12 and then exclude pt how have systemic problem /syndrome/sever trauma/accident and how could be odd .then I start to screen this information and put it in table.

Title:

Should attack attention /not wordy/just specific word /clear/not misleading (have Avery nice title and when you read it ..its a case report /what you was doing must mention in your title but shoos key word (infra occlusal /ankylosis/sub mergen)if target population is important mention it /the name of researcher can be mention also .

Ex : indetecte for every Tx in orthodontics ………(wordy.. Lots of words I lost my pleasure to read )

 Royal London space analysis reliable and doesn’t influence orthodontics treatment designe (very good …any one interested in royal London space analysis will read it /has key word /its to the point )

Proplem in research problem :

Before you can create a problem of your own you must first know what a research problem is. This is a difficult step especially if you are an inexperienced researcher. Research problems are explanatory devices; they are carefully designed sentences about what you intend to find out.

It is difficult to design a problem statement and you should give it a great deal of careful thought. When you write the problem statement, your words must show an understanding of the research phenomena and should explicitly reveal your purpose.

You should go directly to the problem in the first sentence of page 1. Resist the temptation to give background or set the stage for the problem. When the protocol is read, the reader will want to know the purpose of the study immediately. They will not want to search through several pages of text to discover what the protocol is about. To be effective your opening words should be clear and demand attention, for example:

* 1. In this study I intend to find whether the use of a fixed functional appliance (the Herbst appliance) will result in greater skeletal change than a removable functional appliance (the Twin Block). If I can show that this occurs this will be an important finding for orthodontic care.
	2. This will be an investigation to evaluate the effect of functional appliances upon facial growth.

If we examine the two statements above, statement 1 is easier to read because it is in the first person. This should be your preferred writing style as opposed to the use of passive voice (statement 2). You should, however, be careful that the first person is not over-used and that your protocol does not read like a ‘letter to mum’.

Avoid the ‘look around’ approach to a research problem. It is very important to avoid the ‘lets start a project and see what happens’ approach. This will inevitably lead to a poorly coordinated and cumber some project, which drifts and may not have a well defined ending. As a result, the statement of the problem should be explicit.

*Background (including the literature review)*

The most important feature of the background to the project is that it should be brief and to the point. For a research protocol the background should be no longer than two pages of A4 paper. In this section, you should concisely review the literature that is relevant to the problem that you are trying to solve. In this respect, it is probably good practice to limit the number of papers quoted to less than 20.

When you write the review, you should draw attention to the good points and the deficiencies of the studies quoted. You should also remember that it does not always mean that if a study has been published in a journal, it is flawless in its methodology and conclusion(must be your word ). Nevertheless, you should not be too critical of previous investigators because research technology and under- standing of data analysis is a fast-moving field. Remember, if your study is published and it is considered state of the art today, it could be torn to shreds by neophyte researchers in 10 years time!

In terms of writing style it is good practice to make your writing flow. There is a tendency to introduce concepts and previous studies by simply going through a shopping list of papers.

**3rd part**
You need to show a gap

**The aims :**The aims of the research should be clear , confined to the intention of the project and arise from the literature review.
-We found a problem , we found a gap , this is how the aim retained

**Hypothesis**-should always be in the null form (eg. There is no difference between treatment A and B ), you can prove it or reject it at the end of the study ,
, you can prove it or reject it at the end of the study , you should not be biased or take a side at the beginning of the stud**y**

**Method of investigation :**you can use the active voice and future tense ( don’t use passive voice )
it should be in future tense unless you are publishing the study (use past tense ) but if you are writing a protocol it is the future .
-the method should be structured using the following subheadings:
1.subjects (animals, samples ,patients, specific patients , …)
2.design (is it a clinical study ,retrospective or just a questionnaires , what type of study your carrying out )
3.experimental procedure
4.materials ,measurements and apparatus used (you can also mention how much the cost )
5.sample size calculations
6.the statistical methods that you are doing to use

\*\* the doctor started to show examples , I don’t have the slide ,,, so here is what she said
\*eg.1 :-we design ( active voice )
 - panoramic radiographs (what did they use )
 -patients , impacted mandibular canine , what did they include and what did the exclude(describe the study )
\*eg.2 : - in the past ( because it is a published article )
 - panoramic radiograph, inclusion criteria, exclusion criteria

When you describe the **subject** of a study , you should report the following information :
1.the population the subject will be drawn from ( if relevant )
2.the total number and the number in any subgroups within the investigation .
3.all aspects of of subject selection that will provide information on the removal or minimization of bias.
4.the inclusion and exclusion criteria for the subject .
\*eg :23 radiographs ,no overlapping cervical vertebrae ,never have any type of orthodontic treatment
\* sometimes it is important to mention the age

then **the design** (statistical design ):
describe exactly how the total subject pool is to be divided into comparison groups .
\*eg. : patient who are satisfied with the exclusion criteria were invited and randomly allocated (randomized clinical trial )

Then **the procedure**:
this will describe exactly what are you doing to do with the subject , include details of :
1. Treatment to be provided to the experimental group (did you provide treatment or it is only screening and scanning )
2.the method to be use to collect data ( you in person ,3 researchers ,are they blinded )
\*eg.: 17 participant where asked to examine 31 sits of records , one month they examined it again and fill the records again .
-mention everything step by step . so if anyone in the future want to repeat the study he will follow the same steps
-help other researcher to investigate your study

Then **the measuremen**t :
-describe the materials and the outcome measure to be used in the study
-also mention the name of the company that made the device that is used
-include any forms or questionnaire you intend to use
-how you will store and handle the data

Then **sample size calculation**:
-should not mentioned in details (don’t intend to describe the various methods for calculating the sample sizes to be used in an investigation )
-but it is essential part all protocols
-you should mention on what did you base your sample size calculations( I did not hear what the doctor said|)
-if the sample size is too small there is a considerable risk that the study may not be sufficiently powerful to detect a difference between the groups , if true difference exists .the study would .therfore, be worthless and a great deal of effort will be wasted .

Then **statistical methods to be used** :
-it is essential that the statistical methods to be used in the investigation are outlined in details
- it is not sufficient to merely state the names of test to be used , you should describe the rational choice of statistical test .
-also mention the software you used, some journals ask for excel files to recalculate your results

**Project milestones** :
it is not essential
-it does provide a guide ( and reminder) for you and your supervisor to inform if u are ahead or behind schedule with your project

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