

Research Methods in Health Promotion
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Lecture 30; The Embedded Design

So, hello and welcome back and in this particular lecture we will discuss the Embedded Design. So, by now you know we are done with the convergent, the explanatory, the exploratory design we are done with all those three designs. So, you know the convergent design, the sequential, explanatory, the sequential, exploratory those are the core mixed matter design. But apart from the three core mixed matter design we also have some you can say a complex or more advanced mixed matter design. Now, we have many, but here what we will do we will focus on the definitely on the embedded design and we will focus on the experimental model. So, in this lecture we will be covering the overview of the embedded design, the choice of the embedded design, the embedded experimental model, strengths and challenges in using this particular design.

Now, the embedded design is a mixed matter design in which one data set provides a supportive or secondary role in a study based primarily on the other data type. So, that is important. So, you have to keep these few points in your mind that here we are basically embedding. The name itself you can understand by the name only you can you know understand the meaning of this particular design that one data is actually you know one particular data type we are embedding with the other one.

And here one data set it has a supportive and secondary role in a study which is based primarily on the other data type. So, we have some primary thing, but to have more robust study you know more robust understanding of a particular research problem and also you know well when I will be discussing the experimental model the trial. Then you will understand that what is the secondary role of qualitative and how that is very important in developing intervention, in implementing and also in the follow up process. Now, the premises of this design are that a single data set is not sufficient. So, here you have to understand that the single data set is not completely sufficient that different questions need to be answered and that each type of question requires different types of data that is very important.

Now, researchers you know they use this particular design when they need to include qualitative or quantitative data to answer a research question within a largely quantitative or qualitative study. So, in your mind you know in your aim I mean as a researcher you have your own aim. So, you have a large quantitative study I mean you can have a intervention trial in your mind, but this qualitative will actually you need that particular qualitative data also to answer your research question within that particular intervention trial. Now, this design is particularly useful when a researcher needs to embed a qualitative component within a

quantitative design as in the case of experimental design. Now, see there are many variants of embedded design the correlational model, the experimental model, the embedded experimental model.

So, as I said we will here learn about the experimental model in details. So, what is happening in this particular design? What this design is actually useful when a researcher needs to embed? Now, what is happening you have your own trial. An intervention trial so, within a quantitative design you have, but now you also need to embed a qualitative data also the qualitative portions the qualitative finding is also very important here. Now, in the experimental design the investigator includes qualitative data for several reason such as to develop a treatment or intervention package to examine the process of an intervention and or to follow up on the results of an experiment. So, all the three important point now in our subsequent slide we will read I mean we will try to understand the embedding of this qualitative data at each step in details.

And what are the uses why actually we are embedding this particular qualitative data in a particular step. Now, the embedded experimental model so, through in the embedded experimental model we will try to understand the things. Now, this model is defined by having qualitative data embedded within an experimental design it can be you know through experiment or quasi experiment. Now, priority of this model is established by the quantitative then experimental methodology and the qualitative data set is subservient within that methodology. So, you have you know a quantitative and you know intervention trial you know in public health you often implement in intervention trial.

So, you have that in that particular model the experimental methodology the pre intervention and the post intervention you have in your hand. Now, the important thing is you know in that previous slide we talked that the qualitative findings of the qualitative data set is secondary, but that is also very important. So, here what is happening the qualitative data set is subservient within that particular experimental model or the trial or the experimental methodology. Now, this design adds qualitative data collection into an experiment or intervention. So, that the personal experiences of participants can be included in the research.

So, if you go entirely for the quantitative you know thing what is happening you will be missing the essence of the qualitative part that is the person or the participants their opinions and experience which is very very important. If you consider you know developing an intervention or also you know after the trial if you feel that yeah what went wrong why the particular intervention package was not that effective in changing health behavior. So, in that case what happens we often think that this why part is very important. So, what will happen in that case you are missing the essence you know you are missing some important things which you can only have when you go for the qualitative data collection when you have the qualitative findings. So, that particular views opinions and participants experience is very important either if you want to develop your intervention package you are in you know the

intervention tool or if you want to see that yeah during the process of intervention you know what are the problems they are facing whether I have you know as a researcher I have developed one intervention package.

But you know they are having some problem in accepting or you know during implementation you see that yeah these are the problems from the beneficiaries end. So, during the process you see so, for that what you have to do you have to have some qualitative part and also after the intervention implementation when you go for evaluation and the follow up you see that yeah what were the things what were the influencers what were the barriers ok. Then and in fact, you know after that in the last phase what happened you can have a very very good feedback of your entire intervention development and implementation. And what happens when you have a good feedback know that yeah these are the things which went wrong that is why our intervention was not that effective ok. It could have been more effective, but it was not that effective then in that case you have a very you know things you have in your hand that yeah these are the factors ok.

These are the things which actually affected the outcome which actually either it can it can be it is not always necessary that there were some barriers only there were some facilitators also. That is why you know that particular intervention was effective in some way ok. So, everything you should be as a researcher you know if you are very clear with all these factors then what will happen you have a very elaborated things and findings and feedback. And then next time if you develop you can you know next time what will happen while developing any intervention or while implementing any intervention then what will happen you can keep all these things in your mind. So, what will happen it is always you know said that if you can you know involve all these if you see that yeah these were the problems and you can address all those factors and problems.

Then it is said that the next time when you develop intervention when you implement ok. So, that will be much more effective than the previous one ok. Because now you have the why component why things went wrong what was the what were the factors ok. So, this is very important that is why you know this embedded experimental model it is also known as mixed methods intervention or mixed method experimental trial. This has become quite common now in public health and now you know the researcher they are more into and they have started realizing the importance of embedding the qualitative part in different steps of a of an intervention trial ok.

So, as a researcher you can also have you know you can plan embedded experimental model ok. Now, this design can either be used as a one phase or a two phase approach I will discuss in my I will discuss in my next you know slide. So, either it can be one phase or two phase approach in which the timing reflects the purpose for including the qualitative data. Why at this point of time you are having the qualitative findings in your hand and you are utilizing

that particular qualitative findings. So, this is very important at what time at what step you are going for the qualitative data exploration.

Now, what happens see the researcher you know they must decide at what point in the experimental study to collect the qualitative data. It can be either before intervention or during or after the intervention. Now, this design should be made based on the intent for including the qualitative data. As I always say and you will also find you know in text book in this text book by Creswell that intent of the researcher is important why and when and how qualitative data is actually been included. Why you are going, how you will you know include the qualitative data.

So, that is important to you know make your intervention to shape the intervention. In fact, to design the intervention and to make your intervention more robust you can have your qualitative data and during the interventions you know during treatment or intervention to explain the process of participants during intervention or to follow up on the results of the experimental trial. So, let us discuss one by one. Now, first is a one phase approach. Now, in one phase approach what happens we can have the qualitative data embedded during the intervention phase while we are implementing.

So, then we can have the qualitative data such as when a researcher wants to qualitatively examine the process of the intervention in addition to the quantitative outcome. You know that you are going to have you know you are going to implement this particular intervention and definitely you will have some quantitative outcome, but that is not enough. You are embedding the qualitative data qualitative findings during your implementation during your implementation of intervention package. So, when investigators gather qualitative data during the experiment they often you know query they often ask process questions to identify how participants experience the intervention. You know what happen I might think that you know I will give you know this these messages these kind of materials I will just develop and implement, but important thing is that you also have to understand whether they are comfortable with all those things right.

Whether it is actually feasible for them to adopt all those you know intervention all those behavior change techniques, whether for them those things are acceptable in certain community you know they have their own values and beliefs you cannot just force something on them. Otherwise see what will happen it will never be effective they will come they will listen to you they will listen to you they will go home, but as a researcher now your aim is that yeah your intervention should be effective that should bring some positive change. In that case what happen you have to understand how the participants you know they failed how they experience the entire intervention phase the intervention implementation phase that is very important. Then for before intervention approaches the researcher needs to decide which qualitative results will be used in the quantitative phase. Now, in you know you will find that

in while it is mentioned one phase it is about during intervention when it is mentioned two phase it is before and after intervention.

Now one thing is also important you can embed the qualitative data in all the three phase ok. So, if you think that yeah according to your research question your rationality and your objectives if you feel that you have to include the qualitative data in all the three phases you can go no issue and no problem in this. So, for before intervention what we do the researcher needs to decide which qualitative result will be used in the quantitative phase ok. So, this is just before you are exploring it is more like you know the exploratory one the sequential exploratory one. So, again the qualitative data collection should be carefully designed to match the intent for including qualitative data the same thing which I have just said such as to develop an instrument or shape the intervention and that is very important.

Now you know what happen I think in my own way, but actually you know there are so many influencer of your audience of your beneficiaries. So, you also have to keep them in your mind you know you want to I mean you want to develop and implement an intervention package related to the knowledge and practice of antimicrobial resistance among school children among the school going adolescence. So, in that case you can think that yeah before developing you know intervention you are having quantitative survey with those school students with your participant, but just because this is a this is an intervention trial and you also have to develop your own intervention package. Then as a researcher you can go for qualitative data collection among the teachers ok. Because you know the teachers they can very well you know tell you that yeah the school students you know they have these kind of views then apart from that if we develop this particular type of intervention it will be more easy for them to adopt ok.

It will be very feasible for them you know they will be quite comfortable. So, the thing is that for shaping and making your intervention more appropriate and more robust you can embed qualitative data before the you know the intervention. So, researchers collect qualitative data prior to an experiment so that they can use that information to plan specific intervention activities that will be appealing or useful to the participants. Now that is important you know for the last few minutes we you know keep on we are keeping on discussing that yeah whether this particular intervention will be useful for the participants whether they it will be you know acceptable to them whether it will be appealing to them whether they will be comfortable with that particular. So, that is why we go for before intervention approach and we embed the qualitative data before intervention approach ok, before intervention step.

And then after intervention approaches decision must be made about which aspects of the trial will be further explored what findings. Now, post you know post intervention quantitative findings you have which particular findings you want to explore more because as a researcher you feel that if I explore these particular things then I will be able to understand that what went wrong, what were the factors you know what were the barriers and facilitators then I can have a very good understanding and good picture I can have a feedback ok. A kind of feedback you

can have here these things went you know right these things went wrong. So, trial will be further and the researcher must specify the criteria used to select the participants for the follow up data collection definitely. Now, the thing is that if you have decided that these are the particular things you are going to explore then definitely you will in the next step you will also have to think that then which participants ok.

Based on you know which criteria you are going to select the participants and which participants will be selecting for the follow up process for the follow up data collection. Now, the researchers may want to follow up in depth only with the participant who received the treatment or with some selected cases based on positive and negative treatment outcomes or the negative and treatment you know outcomes of your intervention it is entirely dependent on you that here these particular people they you know they got the intervention or these outcome this positive outcome came and you know some negative. So, everything now you know in more or less you have to sit and decide that which particular things you are going to be you are going to explore and you can have an in depth you know understanding of those particular issues and which participants you are going to involve in your last phase. So, researchers collect qualitative data after intervention search information you know it helps explore in more detail. So, it helps you to understand and explore in more detailed outcome results and explain why the intervention may or may not have worked.

So, just now we were talking that these are the results some positive negative whatever and then the why component as I say that is very important. So, now, you can have a clear picture that why this particular intervention have worked or have not worked. Now, this is you can see in this particular figure you see this is your trial quantitative pre-intervention intervention and post-intervention. Now see before intervention we can embed during intervention we can embed and at the end also we can embed. So, finally, our interpretation is based on the qualitative findings which is actually embedded in the large quantitative trial.

So, this is just a figure a schematic way by which you can just understand that how I mean where we can embed the qualitative data before during and after intervention. Now, here you know this slide and the. So, in this slide we will discuss regarding the steps. So, step 1, step 2 and step 3 now in this particular embedded experimental model you can see in the first step or step 1 I have mentioned that how qualitative data will be used in the experiment. So, you have your intervention or experiment in your mind, but how qualitative data will be used where to embed you know what is the utility of that particular qualitative data.

So, determine why qualitative information is needed and how it will be used and identify whether qualitative data will be collected before during or after the intervention or in all three places. As I said it is totally dependent on you, dependent on you in the sense your research question your own rational of the study and definitely the feasibility is also very important and your objectives. So, then we you know you have the quantitative you know that intervention

trial in your mind. So, you have to conduct the trial. So, specify the conceptual model guiding the design then assign participants to the experimental and control groups.

Then design and implement the experimental you know treatment you have to design measure the outcome variables, then you have to go for the analysis of the quantitative data. So, by descriptive or inferential statistics ok. So, which actually can answer your research questions. Then collect analyze the qualitative data where it was placed in the experiment. Now the important thing is do not get confused this is a just a flow chart you can say where step by step things have been mentioned.

Now important thing is when you have decided where actually you are going to embed. Now if it is before intervention definitely you have to what you have to do in the before intervention phase only you have to complete your data collection analysis right. So, then collect and analyze the qualitative data where it was placed in the experiment. So, this is this particular statement is very important where it was where you have decided to place that to answer the qualitative research questions definitely you have your research question for the qualitative part also why are you why and where you are going to have or embed the qualitative data. Then undertake procedures to integrate the quantitative and qualitative result based on the reason for including the qualitative data.

Now what is a particular reason for including qualitative data and in which phase in which step. So, you have to integrate both the findings if it is before then at that point of time if it is during then that point of time if it is after fall I mean after you know post intervention just to follow up. So, at that point of time it depend that in which phase you have used I mean you have embedded the qualitative data. So, you have to integrate both the findings. Then at the end you know you have to determine how the qualitative findings enhance the experiment you could have gone only for the intervention trial why did you also you know I mean why did you decide that I will be embedding I will be using the qualitative data.

So, that has to be you know very clear and that has to be mentioned that how the qualitative findings actually you know helped me or enhanced my entire intervention trial. So, you should write you know you should provide a specific evidence of the use of the qualitative findings. So, what are the use of the qualitative findings at that particular step what was the importance of those qualitative findings at that particular phase. So, specific evidences should be there and at the end you know interpret how the qualitative findings it enhance the entire intervention of the experimental trial. So, you have as a researcher you have to after analysis you know you have to have interpretations of the entire findings and entire study and then only you can come to certain conclusions.

So, you know these were the three important steps and the important points to remember that where actually we will be according to our you know objective where actually we will put the

where we will embed the qualitative data. So, like you know in antimicrobial resistance just we were discussing about the example on the antimicrobial resistance knowledge and practice among the school students. So, as I said before the experiment before the intervention what we can do we can have teachers perceptions and views also. Then during the intervention you can you have to see that here what happened you can have some focus group discussions or you can have other qualitative matters you can have interviews and you can just understand that how the adolescents I mean how the school students. So, what was their experience during the intervention during the implementation of intervention how they felt whether it was pleasant whether it was really very you know for them it was very interesting whether it was really for them things were quite comfortable or things where you know for them it was very difficult to understand those messages or for them some other methods could have been you know I mean adapted.

There are so many methods you know that you can use for your implementation of intervention package. Now, you feel in your own way this particular method I can go for these kinds of IC materials will work, but during the process if you have you know the qualitative data collection among the school students among the adolescents. Then you will see that yeah these things actually was not I mean good I mean the students were not comfortable with this particular method or with this particular IC material or the way you know the way you implemented the entire intervention ok. The different sessions of intervention maybe it was too hectic for them or it was very difficult for them to you know catch the every messages to catch every you know all the IC materials your every word if you go for the lecture method in your implementation of intervention. So, it might happen that for them it was very difficult for them to concentrate or for them to catch all the important things which you actually have delivered to them you know in your lecture or in your discussion.

So, it depends what kind of method you have chosen. Then at the end you know follow up also you have to understand that what went wrong actually what went wrong that particular intervention was not that effective. So, in that case also you can have you know some qualitative mode of data collection with the students and you can just understand that yeah what was went wrong what were the actually barriers and facilitators for particular findings. Now, you have some negative and some positive outcome also. So, some particular findings you can just choose and according to your criteria you choose participants. You can also you know choose again the teachers if because you feel that these influencing part these things need to be more elaborated that yeah these outcome have come.

So, it means that yeah some issues are there. So, you can have a group discussion with the teachers, you can have some interviews with the students ok. So, this is just for an example you can have you know different topic, different research problem, different ways according to your own objectives. Now, strengths of the embedded design it can be used when researcher does not have sufficient time resources to commit to extensive quantitative and qualitative data collection because one data type is given less priority than other like an experimental model quantitative has given priority in the sense that it is qualitative part has been embedded in the

large quantitative study that is important. Definitely that qualitative part is important that is why you are embedding, but as we read now they have a secondary role subservient. So, this design may be logistically more manageable for students it has been mentioned in text books that this design may be logistically more manageable for student because one method require less data than the other method.

And this design may be appealing to the funding agencies for research project for funding agencies because the primary focus of the design is traditionally quantitative you know mostly traditionally we keep on doing quantitative, but no doubt now for last few years we are more into mixed matter research there is no doubt in this, but just one example experimental trial. Mostly you know what people do they just go for the pre intervention intervention post intervention just a trial. So, with control group or without control group they go for the intervention of the experimental trial, but you know this becomes more appealing to funding agency because here definitely our major you know aspect of major thing is the that traditional quantitative or the experimental trial. And I feel that along with that if you know nowadays if you have the qualitative component also. becomes you know it makes your entire research study more robust then in that case what happened that here it can be more you know appealing to any particular funding agency.

Now the challenges researcher must specify the purpose of collecting qualitative and the quantitative data as a part of larger I mean the qualitative into the larger quantitative or in some other variant of embedded design the quantitative in the larger qualitative study. So, determining the appropriate point in the experimental study to collect the qualitative data that is quite challenging that you have to determine you have to be very clear at what point you are going to put your qualitative data as we just you know discussed in the experimental model. Researchers need expertise in experimental research as well as qualitative research definitely you have you should have a very good understanding of the trial also and also the regarding the qualitative research techniques. A few and you know there are very few examples which exist now and very little information little has been written about embedding quantitative data within traditionally qualitative designs. So, this is also important that now very few things which exist and very few in literatures or little information are there regarding embedding the quantitative within the traditionally qualitative designs.

Now, at the end conclusion the embedded design is a mix meta design in which one data set provides a supportive secondary role in a study based primarily on the other data type. Researcher use this design when they need to include qualitative or quantitative data to answer research question within a largely quantitative or within a largely qualitative data based on what kind of variant you are going to choose for the embedded design. What we have done we have actually entirely discussed and we have focused more on the experimental one the embedded experimental model. Now, this embedded experimental model is defined by having qualitative data embedded within an experimental design such as a true experiment or you can have a quasi-experimental study also. So, these are the learning resources go through I would

suggest go through all the textbooks of Creswell be it mix method or the design of qualitative quantitative and mix method you will have a more clear understanding. Thank you.