Research Methods in Health Promotion

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Week 07

Lecture 32: Formulating an appropriate study tool (Quantitative data collection tools)

Hello, in this week we were discussing regarding the different study tools that we use in our health promotion research. Now in this particular lecture we will be discussing on how to formulate an appropriate study tool for your in health promotion research. Now for this particular lecture and in the next few lectures we will be focusing on the quantitative data collection tools only. The topics that relate to the qualitative data collection tool, its formulation and its reliability and applicability in practical settings will be dealt in the last lecture of this week. So, for this lecture we will cover what are the steps in development of a study tool. In this context study tools typically means your data collection tool or assessment or evaluation tool typically we use the questionnaires, schedules or checklist.

So, we will be discussing steps involved in developing these. Next we will have an outlook an outline of the characteristics of a good study tool and we will also discuss the parts of a questionnaire. And to be precise the parts of a questionnaire also apply when we consider it as a schedule. So, let us start our discussion with the steps in developing a questionnaire or an interview schedule.

Now, in the discussion of this development of a questionnaire and schedule in some places you will find that the discussion it kind of you know merges the quantitative study tool like typically the metric based questionnaires and also somewhat the in depth interview guides. We discussed all this context in the last lecture. So, you will find somewhat overlapping in these steps. But the basic idea over here is from a typical questionnaire or a schedule for quantitative data collection you are also collecting certain information and also from an IDI guide you are collecting certain information. They all come under the purview of survey instrument it only depends on how you want your survey to be conducted whether quantitatively or qualitatively.

That is why there will be some overlap in terms of the steps in development of these tools. However, we shall mostly focus on development of the quantitative tools typically the quantitative questionnaire or schedules and typically the quantitative interview guides that means, the interview schedules that we have mentioned over here. So, the first step is you have to make certain preliminary decisions. So, what are the decisions you have to make? Decide on the form that the schedule will ultimately take that means, whether it will be a structured one, whether it will be an unstructured like it can have its own flow or it will be an semi structured one which is a mix of both structured and unstructured versions. Decide on the type of information that needs to be collected.

Actually what nature of information do you need? The nature of information the type of information can be you know like simple perceptions or different behavioral beliefs like this or certain practices like this. The types may vary and you have to define and decide on the types that you want your schedule or questionnaire to collect. Typically this part is decided when you are preparing your proposal. List and operationally define the variables. See the operational definition part we already discussed that this is very important because this is how we convert a concept into a construct by operationally defining we are able to measure these intangible things.

So, that is why the listing of all the variables and how to operationalize them is very much important that means, how do you actually measure that is also necessary and that should be done before you conduct your study or before you actually start developing your tool. And then develop a pattern of coding and recording. So, these are the preliminary decisions like you have to have an idea of if you have say a scale then how you are going to code and in some instances you may need to record the items for example, typically when we analyze a questionnaire when we have certain negatively framed question in order to maintain the direction of the questions all through the all through that scale we often record the items that are negatively framed right. So, when we are developing this questionnaire we have to have some idea regarding the pattern of coding how we are actually going to code the responses that we get or code the categories of the variables or the levels of the variables like this and if needed what should be the format for recoding ok. Next is once you have decided on all this next is the drafting of the schedule.

Now in between these two steps and also before preliminary decision making regarding developing your schedule or questionnaire what you have to do you have to extensively search the literature. Now remember it is based on the literature that you are performing your study because see it is the chain of the of the investigations is a chain of the research that ultimately has led you to conduct your own research that is the basic information that we need before embarking on a particular health promotion research. So, the same literature review will help you understand how you are going to design your study tool. See if you have a research question which in some way has already been asked by some other researcher then you can take certain information from their research and you can gain some certain insights on how the research design or the particular tool design will fare in the in the general population or your target population. So, the literature informs your decision on preparing your tool basically the preliminary decisions that we usually make that is decided upon by the research questions the objectives that we have and also our insights that we gain from doing an extensive literature review.

So, it is not only the study objectives that matters over here also what you have learned through literature review what are the pitfalls of a similar kind of design or what are the pitfalls of a similar kind of you know typical interview schedule you have to factor those parts in. Now, when we are actually drafting the schedule a few components are very much interesting and important as well. Firstly, wording of each question this needs to be carefully monitored why because the wording is very much important because the questionnaire or a schedule typically for a quantitative research you are you have to ask the same question to all the participants and in the same way why because if you change the pattern of delivery of your question or if you change the question from participant to participant then what happens is you are not essentially implementing the same study tool to all the participants and hence your responses that you get from implementing the study tool may vary just only because your implementation of the study tool varied ok. So, that means, the wording that you have in your in your questions for the for your research study they should be carefully monitored. Another reason is if you have used certain words which are not culturally appropriate to your study population then altogether the participants may simply refuse to answer the question or simply refuse to continue on with the survey.

So, wording is important why for basically three reasons first is whether the data collector or the participants who are going to see they have to see the same wording from in between the participants that means, person A response to the same question in the same way in based on the same wordings person B also does the same. Next very important reason is your wording should be very much clear to the participants the participants and the beneficiaries they should be able to understand also remember your data collector should be very clear on what a what a question to ask. And thirdly perhaps in health promotion context this is also very important question that the wordings will will ultimately decide whether the question is culturally acceptable or not. So, these are your considerations when you are actually going on to draft your schedule. Next is decide how to sequence the questions for example, if you have to sequence the questions like so, for example, if you are going to sequence say you have sequence question 1 question 1 basically deals with say gender.

Gender which kind of question regarding gender regarding access to healthcare say ok. Next after you have understood about the access to healthcare then what you can do is do they really access it? That means, you now know that they have the access they can really access this is access to health regarding gender male and female comparison you are trying to understand. So, regarding gender access to health you are now understand that males and females both have access to healthcare. Your next question may be do they really access that provided facility? Now consider this the other way around if you start with this question say this question now becomes question 1 you start with your query that do they really access the healthcare, but the problem is you may not even know that whether any health facilities available there or not like this kind of questions. That means, your typical question number 1 whether the both the genders do are provided with the similar access or not without knowing that you cannot really ask the question whether they perform that behavior really or not this is just a simple example.

So, this is the reason why you have to decide on the sequence of question the sequence should be a meaningful one. So, that the participants are able to understand what you are actually going to ask and you as a researcher should also be clear on what kind of information you are you are trying to elicit from that particular sequence right. Next step is revising and pre testing the schedule that you have developed or the question questionnaire that you have developed. Now how do we basically revise and pre test? See first the draft of the instrument should be critically discussed by experts. So, first step is you have to discuss amongst the experts the experts may be from different fields, but they should have sufficient expertise on how to ask a question and also on the particular topic that you are studying.

Next is you pre test of an instrument is a trial run to determine and in so far as possible its clarity adequacy and freedom from bias. Now we shall discuss how the pre testing part will basically this trial will basically help in understanding whether the question is clear adequate and free from bias or not. So, free from bias means there should not be any systematic error. So, whenever you are pre testing you are finding that your question is devised in such a way that it invariably includes certain selective recall bias. Say the wording of the questionnaire may be in a way judgmental or the sequence of the respondents may put certain cultural stigma in the minds of the respondents.

Now in these situations they may respond in a very different way and that will lead you to a systematic bias or systematic error which we call a bias. You can understand that while pre testing your questionnaire among a similar group of participants. That means, when you are going to pre test your questionnaire you have to you have to implement that among group of participants who are mostly similar to the characteristic of your target population. Now the same pre testing component we will also discuss when we discuss how we arrive at a particularly good intervention instrument. Now this pre testing here what we are discussing is regarding appropriateness and acceptable and the good you know research health promotion research study tool the evaluation or data collection tool right.

So, they are different, but the same pre testing procedure has to be followed for both the tools right. It has to be clear you can understand from the response of the participants and also you know among in some instances after the discussion by the experts that which one can be more clearer or not. So, now after the discussion with the experts you have a clear understanding that you have 10 questions and 2 questions may not be very much clear to the participants. You pre test them and you find out that the participants are saying I cannot understand these 2 or 3 questions. Now based on that you really can revise your questionnaire that clarity is lacking for these questions you have to mark it out.

Also as a whole the questioner should be adequate to address the objectives or the research question that you are studying it should be able to elicit the information that is necessary to test your hypothesis like this. This is again the adequacy will also understand by doing a dry run or a trial run that we usually call the pre test. A pre test does not obtain information on the reliability of the responses and the questions asked. Now this is again a debated area because some of the experts they say that you can conduct a reliability assessment even after doing a small pre test. But in fact, the other school they say that the reliability assessment is typically done on a good number of sample size and it should be done with the focus of assessment of reliability.

That means, the pre test is an exercise where you basically understand whether the questionnaire is going to elicit all the responses that is needed or not, whether it is very much framed clearly the participants can understand the data collectors can clearly state to the participants and whether the responses or wordings or the framing of the questions eliciting certain bias or not. Now what can happen is if you are conducting a reliability assessment for your questionnaire or the study tool it in itself can become a separate study, but again that study is needed why because after pre testing and also the reliability and validity assessment then only you get a truly valid and you know a good questionnaire for your data collection. So, we basically move on with this debate of whether pre testing can elicit certain information regarding reliability or not, but it is always better to pre test for these criteria and then you can move on with your reliability assessment study. Then what is needed is evaluation of the psychometric properties, what we were discussing the reliability and the validity aspect. So, basically you have to establish the reliability of the instrument on a fairly good amount of people.

Now see I have included these two points although they may appear contradictory to you in the first read in the same heading revising and pre testing why because after you conducted the core exercises of the pre-testing then it is your responsibility to evaluate the psychometric properties and within that psychometric property the component of reliability is also there. Although through that pre testing exercise where you are eliciting only the wordings the clarity you are trying to understand the adequacy you are trying to factor in the inputs given by the experts and everything still you must analyze the reliability and validity of the instrument particularly in terms of the items that you have included in your new instrument why. Because after this assessment only after this assessment you are now you do have some evidence that why certain questions needs to be excluded from the questionnaire even though they are consistent with the objective or even though the experts say that these are the important questions they appear clear and also they are free from buzz, but still they may not be reliable or they may not make the questionnaire valid. So, that is the reason why you perform the reliability and validity assessment typically we call them the psychometric properties of the questionnaire after the core exercise of pre testing and then you can either omit certain questions and after omitting those questions you what you can do you can just simply frame a new question of fresh questionnaire which does not have the flagged questions and again pre test and again retest perhaps. So, this is the whole cyclical process how you arrive at your final questionnaire form.

Next you may be needed to translate your tool why because see mostly what we do is we frame our study tools in standard English, but when we are doing certain health promotion research and we are trying to collect data from the population who are not basically native English speakers. For example, those who are not really that much comfortable with English you need to translate your questions so that the people can clearly identify what exactly is being asked. So, for translation also the basic idea is see the English questionnaire that you have already developed you know the basic understanding of the English questionnaire what you want to ask and what is actually being asked, but in field situation suppose you have translated it in Hindi for example, how do you really know whether the Hindi questionnaire is exactly measuring or asking the same questions in the same way as they were presented in the English questionnaire. For that we perform a retranslation to ensure that they are the same the translations are equivalent we perform a retranslation that is translated back to English language to examine the correctness of the translation. Now obviously, the Hindi form when translated to English it will have certain deviations from the original English versions, but it is based on our as researcher our understanding on how much difference or how much deviation we can allow based on the study topic or based on the difficulty of the questionnaire.

Ultimately once we understand or once we are convinced that the retranslation or the back translated version is almost equivalent to the original English version we can now move on with the with the new translated questionnaire. So, that means, now the new translated questionnaire the Hindi questionnaire in this case is equivalent to the English questionnaire that we have already prepared. So, the translation part is also a very important step in preparing your own questionnaire right. Next we discussed that a questionnaire should have its own method of coding and interpretation of the scores and everything. So, now once we have developed all the items we have developed all the sequence and we have decided on how do how to put the options how to basically elicit the responses in terms of wordings sentence framing like this.

We now have to find out what should be the appropriate coding and scoring. See for coding it is an essential part of questionnaire development for example, all items are stated in such a way that some classification of answer is possible yes coded as 1 and no coded as 2. But and in certain in those situations the respondent may be asked to enter 1 or 2 for yes or no. So, in the beginning of the questionnaire you instruct the respondent how to respond if the response to the question is yes then the respondent can simply write 1 and for if the response is no can simply write 2. Now this is a simpler situation where you have very little very short response perhaps.

But if you have longer responses in those situations if you ask your respondents to put only simply the codes it of you know it makes the process faster and also it keeps the respondent engaged for a longer duration of time. So, that is why coding is again a very important step, but when you are you know when you are preparing the coding scheme be very sure that your coding should not be confusing and it should not be so complex that neither the respondent nor the data collector is able to comprehend all the codes. So, typically whenever you are using multiple coding schemes in the same questionnaire it tends to become somewhat confusing. So, always it is better to provide a single I mean a unidimensional trend for coding. So, that the both the beneficiary the respondent if he or she is filling up the questionnaire by his or on their own then they will be able to understand the coding and also if it is delivered by the data collector then the data collector should also be able to understand the coding and simply put the codes.

Now how this putting the codes help? It helps by I mean you know when you entered the data in the computer for generation of the spreadsheet that contains all the information that you gathered from the study there it is easier to put all the codes instead of the large lines. So, that is why it is better always to have a coding state the coding and make it simple. We also said that we have to be very clear about scoring and we have to decide it a priory that what kind of score and what score should be provided and what should be the interpretation of it. So, it is the essential plan for the scoring technique that is necessary for the questionnaire that you are preparing because based on the scoring pattern it you know it examine the type of data and the possible statistical computation. For example, say in this questionnaire this is the questionnaire you have question 1, question 2.

Now you have like you know have like a type response you have 5 responses say 1, 2, 3, 4, 5. Now if I think I want to provide the scores of 1, 2, 3, 4 and 5 how I can consider this? Say 5 means it is the highest response the best match to the statement that you have provided. Now the participants will say 5 ok. So, the response for this for this option it may be coded as 5 as well. So, it is 5 the score is 5 and also for this question now the score is again 5 consider this example.

Now here you have a total score of 10 and a minimum score of 2 for these questions right because 1, 2, 5 minimum score will be 2 and maximum score will be 10. See now from 2 to 10 this becomes a continuum. So, you can consider the total score as a continuous data. Again it depends on how basically you want your analysis to take place and what interpretation you actually want from your study. So, that is why scoring is again a very important thing and very subtle in a very subtle way I discussed that coding the code that you have provided for the responses they can be same as the score you are providing and in most of the cases or in many of the cases I see in yes no responses typically we consider no as 0 and yes as 1 in that case we can score no as 0 and yes as 1 as well.

So, ultimately what happens is the choice of question type would depend largely up to the subject matter of the study that means, what question you are trying to answer, the verbal ability of the respondents, how comfortable the respondents are in terms of these things and the amount of time available. Now that we have understood how to prepare this questionnaire it is easier for to understand the steps in developing the observation checklist. See the checklist is where there is the observer is basically putting a tick mentioning a yes or no to certain behaviors right or performance of certain behaviors. So, what are the steps? First select the aspect of behavior to be observed. So, behavior is a large thing you can choose a particular aspect of that behavior that you want to observe in through your checklist, then list the categories of the behaviors or to put it simply list the sub actions of those behaviors what are the parts that you want to observe that makes the aspect complete you have to list up all those things.

The most common method used in structural observation is the construction of the category system. Now we will come to the category system later on in the next slide. So, the category system must be there it relates to preparing all those actions of that particular behavior. Next you have to quantify your observations that is assignment of a score if you put a tick that means, the performance of the behavior is there or performance of that particular action is there that means, you can score it as 1 and if it is not present you can score it as 0. So, similar to what we observed in the observe in the questionnaires in observation checklist procedure as well we have to put a certain score.

Then developing procedures to facilitate recording see when you are observing something that is an active process on the part of the data collector, but is basically a passive process on the part of the respondents because the respondents are performing the activities may be with or without the information that somebody someone else is watching or observing the action right. So, in that situation as the data collector what you have to do is you have to find certain suitable places where you can basically set or you can stand with appropriate gadgets of your own and you can simply tick with each and every aspect that you observe or each and every action that you observe. You can do it either while they are performing this behavior you can just put a tick or after completion of the behavior you can also put a tick. So, what are the steps in developing the observation schedule or checklist? We discussed now what we are discussing is this part this is the construction of the category system. So, what happens is once you have developed the category system it may be so that a particular behavior this is the behavior it has certain distinct categories.

Now the categories these are numbered and limited then it is easier for you to put all these categories in the checklist and you can have a one page or two page long checklist to observe all the items. But if you have a long list of behaviors that means, you are studying a very large aspect of a particular behavior or you are studying the behavior as a whole then you may not have these categories these distinct categories mentioned in your checklist why because they will make the checklist like 5 or 10 pages long. Instead what you do because you know that not all the person are going to perform all these behaviors you just simply put a code to them you make certain combinations of these actions these categories maybe this is present this is absent this is absent like this and you make different combinations and you put code to those combinations. Then what you do is this is a as an one aspect of the behavior this is again one aspect of the behavior you also have certain sub aspects and sub of actions you can put different combination of these action and say you again have another behavior. Now, what happened in this situation is to avoid a long list of behaviors you put only the major behaviors in the list and you make codes for all these possible combinations right.

So, that is what we have already discussed regarding the category system it has to be careful and explicit definition of the behaviors and characteristics to be observed you have to make them distinct and clearly defined to the data collector to understand this is this marks the completion of this particular action like this. Referent behavior should be mutually exclusive, exclusive means there should not be overlap you should not frame your observation in such a way that it contains I mean they overlap in some way. Coding we discussed we have to have certain parts of coding and the system that you develop the sub the checklist it should also be applicable in certain other similar research situations. Again for the checklist you have to have a pilot run and you have to keep on going developing and refining the retesting part. See for questionnaire we had the items where we were you know including and excluding and in checklist what you have to do in the pilot run we have you have to understand whether the items that you have put typically the actions whether they are exclusive or not how if they overlap then how to make them exclusive like this and you have to keep on testing and retesting them.

Here your main focus group should be the data collectors because they are the ones who are collecting the data and they are the ones who are understanding the actions that you have mentioned. So, from there you can again rectify the errors in your checklist and again retest it. Now, this brings us to the next question what are the characteristics of a good questionnaire on interview schedule. It deals with what is significant to the topic under study. So, it should be focused on the research question it is information that cannot be obtained from you know the standard reports or the standard secondary data it should elicit those information it should be as short as possible because if you may keep it short then the participants will remain engaged and you know there will not be any questionnaire fatigue.

It should be attractive in appearance it should be clearly arranged comprehensive and lucid in language and also the items that you present we mentioned about the sequence they should be in a good psychological order. So, that the participants they not only remain engaged, but also they are able to understand the question and respond in a way that you want them to respond that means, in a in a logical way ok. So, now this brings us to the last discussion of this lecture what are the parts of a questionnaire. Till this point what we have understood and what we have discussed is how do we develop the items in a questionnaire and how do you frame the questionnaire we discussed that there should be items then there should be coding scoring same for questionnaire and also for a checklist. So, that means, a particular questionnaire should have an introduction and certain instructions.

What is the thing that you are going to elicit and how the respondent or the data collector should quote them or mark the responses that should be clear. Then there should be certain personal data regarding the participant who is responding to your questions. There should be certain background information about the participant background information typically include the head of the family's occupation, the environmental conditions like this then you should provide the content directly the actual information that you want your participant to state. And finally, before you conclude you should acknowledge the participant for the responses with a brief thank you. So, in conclusion we discussed about the development of the questionnaires and the checklist and we know that there are multiple sequential steps there may be you know a cyclical process you have to follow.

We discussed about the coding and scoring that we need to perform in the quantitative tools and we discussed that a good questionnaire should be clear comprehensive and lucidly worded. Also you have to maintain the time and you have to maintain at make the questionnaire short so that the person who is responding does not feel any fatigue. So, this is these are the resources that you can study for development of your own health promotion research questionnaire that is all for this lecture. Thank you for your patient hearing. Thank you.