Methodology Series Module 8: Designing Questionnaires and Clinical Record Forms

Maninder Singh Setia

Introduction
As researchers, we often collect data on a clinical record form or a questionnaire. It is an important part of study design. If the questionnaire is not well designed, the data collected will not be useful. In this section of the module, we have discussed some practical aspects of designing a questionnaire. It is useful to make a list of all the variables that will be assessed in the study before preparing the questionnaire. The researcher should review all the existing questionnaires. It may be efficient to use an existing standardized questionnaire or scale. Many of these scales are freely available and may be used with an appropriate reference. However, some may be under copyright protection and permissions may be required to use the same questionnaire. While designing their own questionnaire, researchers may use open- or close-ended questions. It is important to design the responses appropriately as the format of responses will influence the analysis. Sometimes, one can collect the same information in multiple ways - continuous or categorical response. Besides these, the researcher can also use visual analog scales or Likert's scale in the questionnaire. Some practical take-home points are: (1) Use specific language while framing the questions; (2) write detailed instructions in the questionnaire; (3) use mutually exclusive response categories; (4) use skip patterns; (5) avoid double-barreled questions; and (6) anchor the time period if required.

Examples of Some Questionnaires
National Health and Nutrition Examination Survey (US)
This study assesses the health and nutritional status of children and adults in the United States. This detailed survey collects data on the demographic, socioeconomic, dietary, and other health-related questions. Besides these, data on medical, dental, physiological measurements, and laboratory tests are also collected in the survey. Thus, this survey is a good mix of interview, clinical examination, and laboratory tests.

National Population Health Survey (Canada)
This longitudinal survey was started in the year 1994. This survey collects information about demographics, household structure, use of health services, and many health status indicators in a cohort of individuals. Some of the health indicators are: Self-perception of health, health utility index, and chronic conditions. Besides, the questionnaire also collects information on smoking, physical activity, and alcohol use.

Although these examples are not directly related to dermatology, we strongly encourage the reader to read

Key Words: Categorical responses, questionnaires, scales
these questionnaires. They are well-designed surveys and are useful reference material for future researchers.

Initial Steps in Designing a Questionnaire

Prepare a list of all the items and variables that will be required in the Clinical Record Form or Questionnaire

It is useful to make a list of all the variables that will be assessed in the study. These may include demographic data, clinical data (history and examination), behavioral data, investigations, diagnosis, and follow-up parameters. The detailed list of variables will depend on the study objectives. For example, if you wish to study the association between clinical and sociodemographic features, you should list all the potential demographic variables and clinical parameters. These may be age, gender, marital status, living conditions, family structure, individual income, household income, etc. The complete list is often prepared after a thorough review of the literature. One may find some additional variables reported in literature for similar studies or reported in a different manner.

Read all the existing questionnaires and scales

The researcher should review all the existing questionnaires. It may be efficient to use an existing standardized questionnaire or scale. Many of these scales are freely available and may be used with an appropriate reference. However, some may be under copyright protection. Thus, it is useful to understand copyright issues and acquire necessary permissions to use the same questionnaire.

A socioeconomic status scale that is widely used in India is the Kuppuswamy scale. It classifies an individual based on education, occupation, and family income. It may be worthwhile to consider this scale for evaluating the socioeconomic status; this assessment is comparable across many such studies. One should avoid arbitrary cutoffs. It is important to have some justification for classification for socioeconomic status; this assessment is comparable across many such studies. One should avoid arbitrary cutoffs. It is important to have some justification for classification for socioeconomic status; this assessment is comparable across many such studies.

Standardized tools are available for common measures such as tobacco use, diet, exercise, and pain. The researcher should read these tools and use whenever applicable.

An important take-home message is - Do not attempt to design questionnaires before a thorough literature search.

Start Preparing the Questions

After the review has been conducted and the variables have been identified, the researcher should start writing the questions. The questions can be designed in multiple ways.

Open-ended questions

In an open-ended question, the researcher does not provide any option. The participant can respond to the question in his or her own words.

Example: How can we prevent malaria?

Sometimes, these questions are designed to get information from participants. For example, in the above question, some participants may make some recommendations that may not be correct. However, it is useful to collect this information to address misconceptions in the society.

Close-ended questions

In a close-ended question, the researcher provides options to the participants. They are asked to choose a single response or multiple responses.

Example:

| Question | Options | Check box |
|----------|---------|-----------|
| What are the routes of transmission of HIV? | Unprotected sexual act | |
| | Mosquito bites | |
| | From an infected mother to the newborn child | |
| | By infected needles | |
| | By sharing toilets | |

Notice, in this question, more than one option is correct. In this case, there should be an instruction – “You can select more than one.”

In close-ended questions, the responses should include all potential options, or if the researcher is not sure, it is advisable to add “Other” and “Specify Other” to the list of options. The “Specify Other” response should be open ended.

Example:

| Question | Responses | Check box |
|----------|-----------|-----------|
| What are the routes of transmission of HIV? | Unprotected sexual act | |
| | Mosquito bites | |
| | From an infected mother to the newborn child | |
| | By infected needles | |
| | By sharing toilets | |
| | Other Specify other | |

Finalize the format of the responses

It is necessary to design the responses appropriately. The format of responses will influence the analysis. Sometimes, one can collect the same information in multiple ways. Let us discuss these options.

Option 1

| Question | Responses | Check box |
|----------|-----------|-----------|
| What is your height (cm) | - | |
Option 2

| Question                          | Responses | Check box |
|----------------------------------|-----------|-----------|
| What is your height (cm)         | <150      |           |
|                                  | 151-175   |           |
|                                  | >175      |           |

In Option 1, the actual height of the respondent will be entered. For example, if the height is 149 cm, the researcher will enter 149 in the response column.

In Option 2, the responses are categorized into groups. Thus, the researcher will check box 1 (since 149 cm <150 cm).

If one is sure that one will analyze the response categorically, it may be useful to create categories *a priori*. However, if one is not certain about analysis, it is better to collect the data as a continuous variable (Option 1). One can always create “categories” from continuous variables during analysis.

In some cases, however, the categories may be predefined (such as body mass index categories) or may be the only option available (such as occupation). In addition, for some variables (such as income), participants may be comfortable with categorical responses rather than the actual value.

Besides these, the researcher can also use visual analog scales (VASs) or Likert’s scale in the questionnaire. We will discuss these in the next few examples.

VAS can be used to measure experiences which cannot be directly measured. A commonly used scale is the pain VAS. In dermatology, VAS scales have been used to assess pruritus. A line is drawn with no experience and maximum experience as its two end points. The participant is instructed to mark the point on the scale that represents the current experience.

No experience | Severe experience  
(Pain, pruritus, etc.) | (Pain, pruritus, etc.)

In Likert’s scale, the researcher provides categorical options (usually in ascending or descending order) to understand attitudes and experiences.

Example: We want to know patient’s experience to the services in our hospital.

| Question                          | Responses | Check box |
|----------------------------------|-----------|-----------|
| How will you describe your experience in our hospital today? | Excellent |           |
|                                  | Very good |           |
|                                  | Good      |           |
|                                  | Fair      |           |
|                                  | Poor      |           |
|                                  | No response |         |

Thus, it is important to think through the format of the response for each question.

Additional Tips in Preparing Questionnaires

**Language**

The researcher should use simple and specific language while framing the questions, particularly those on knowledge, attitudes, experiences, behaviors, and practices. The clinical record form (which will be used only for data abstraction) may be technical.

It is advisable to avoid extremely negative or threatening language in the questionnaire, particularly toward the end of the questionnaire. This may be less relevant in clinical records, but it is important in sociobehavioral questionnaires. For example, it will be inappropriate to end the questionnaire with the following question.

| Question                          | Responses | Check box |
|----------------------------------|-----------|-----------|
| How often do you worry that you will be jailed for your behavior? | All the time |           |
|                                  | Most of the time |      |
|                                  | Every once in a while |  |
|                                  | Rarely |           |
|                                  | Never |           |
|                                  | No response |         |

**Time period**

The researcher should include the time period for behaviors and practices. Do not leave it ambiguous. This is called “anchoring the time period.”

Example:

| Question                          | Responses | Check box |
|----------------------------------|-----------|-----------|
| How often have you used condoms with casual sex partners? | Always |           |
|                                  | More than half the time |      |
|                                  | About half the time |        |
|                                  | Less than half the time |   |
|                                  | Never |           |
|                                  | No response |         |

Well, the time frame for casual sex partners has not been defined. It could be lifetime, past 3 months, past month, or past week. We can redesign this question.

| Question                          | Responses | Check box |
|----------------------------------|-----------|-----------|
| In the past 1 month, how often have you used condoms with casual sex partners? | Always |           |
|                                  | More than half the time |      |
|                                  | About half the time |        |
|                                  | Less than half the time |   |
|                                  | Never |           |
|                                  | No response |         |

**Instructions in the questionnaire**

Please include detailed instructions in the questionnaire. For example, it should be clearly mentioned in the questionnaire if the participant has to select one response or more than one response for each question.
**Example 1:**

| Question                                                                 | Responses                                    | Check box |
|-------------------------------------------------------------------------|----------------------------------------------|-----------|
| According to you, which is the most common route of transmission of infection in your state? (Check only one response) | Infected needles | Sexual transmission | Infected mother to child | None of the above |

**Example 2:**

| Question                                                                 | Options                                      | Check box |
|-------------------------------------------------------------------------|----------------------------------------------|-----------|
| What are the routes of transmission of HIV? (You may check more than one response) | Unprotected sexual act | Mosquito bites | From an infected mother to the newborn child | By infected needles | By sharing toilets |

**Skip patterns**

Please use “skip patterns” in the questionnaire. This will be useful to avoid data collection and data entry errors. Furthermore, this also makes questionnaire administration efficient. These instructions should be included in the questionnaire.

| Question number | Question                                                                 | Responses | Check box | Instruction |
|-----------------|--------------------------------------------------------------------------|-----------|-----------|-------------|
| 2               | Did you have sex with females in the past 1 month?                       | Yes       |           | Go to Q4    |
|                 |                                                                           | No        |           |             |
| 3               | In the past 1 month, how often have you used condoms with females?       | Always    |           |             |
|                 |                                                                           | More than half the time                       |           |             |
|                 |                                                                           | About half the time                           |           |             |
|                 |                                                                           | Less than half the time                       |           |             |
|                 |                                                                           | Never                                            |           |             |
|                 |                                                                           | No response                                    |           |             |
| 4               | Did you have sex with males in the past 1 month?                         | Yes       |           | Go to Q6    |
|                 |                                                                           | No        |           |             |
| 5               | In the past 1 month, how often have you used condoms with males?         | Always    |           |             |
|                 |                                                                           | More than half the time                       |           |             |
|                 |                                                                           | About half the time                           |           |             |
|                 |                                                                           | Less than half the time                       |           |             |
|                 |                                                                           | Never                                            |           |             |
|                 |                                                                           | No response                                    |           |             |

In the above example, if the response was “No,” the participant should not be asked about condom use with casual partners. Thus, the interviewer has to skip this question and go to Question No. 4.

**Mutually exclusive response categories**

The responses should be mutually exclusive. If the same response is present in two options, the participant or the interviewer may not know the appropriate check box.

| Question                                                                 | Responses | Check box |
|-------------------------------------------------------------------------|-----------|-----------|
| In the past 1 week, how many cigarettes have you smoked?                | None      | 1-5       |
|                                                                           | 5-10      | 10-15     |
|                                                                           | >15       |           |
|                                                                           | No response |         |

In the above example, if the participant has smoked five cigarettes, which box is appropriate – second box or the third box? Thus, the categories must be mutually exclusive.

| Question                                                                 | Responses | Check box |
|-------------------------------------------------------------------------|-----------|-----------|
| In the past 1 week, how many cigarettes have you smoked?                | None      | 1-5       |
|                                                                           | 6-10      | 11-15     |
|                                                                           | >15       |           |
|                                                                           | No response |         |

**Double-barreled questions**

Kindly avoid double-barreled questions in the questionnaire. Do not include more than one issue in the same question.

Let us consider this example:

| Question                                                                 | Responses | Check box |
|-------------------------------------------------------------------------|-----------|-----------|
| How much do you agree with this statement?                              | Strongly agree | Agree |
| HIV-infected people have been infected due to their past sins and should be kept in a separate ward | Undecided | Disagree | Strongly disagree | No response |

In this question, there are two issues: (1) HIV-infected people have been infected due to past sins and (2) HIV-infected people should be kept in a separate ward. These items may be used to assess stigma and discrimination in the society. If a respondent agrees with the statement, one will not be able to evaluate if the agreement is with the first issue, the second one, or both of them.

**Use codes in the questionnaire**

It is useful to include codes for responses in the questionnaire. These are numerical values for each categorical response. The researcher can just enter the
codes during data entry. This will be helpful during data cleaning and data analysis.

Example:

**Summary**

In this section, we have described some practical points in questionnaire designing. Please do not initiate designing the survey without adequately reviewing the literature. Some practical take-home points are: (1) Use specific language while framing the questions; (2) write detailed instructions in the questionnaire; (3) use mutually exclusive response categories; (4) use skip patterns; (5) avoid double-barreled questions; and (6) anchor the time period if required. In the next module, we will discuss some theoretical aspects of designing scales including assessment of validity and reliability.

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**Conflicts of interest**

There are no conflicts of interest.

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