Review Article

Developing a questionnaire in occupational epidemiological research: Some common sense guidelines

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Abstract

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Background: The most common method of collecting data in any area of human health research is to apply a questionnaire. However, if extreme cautiousness is not taking into account while designing a questionnaire, the gathered data might be ineffective. Therefore, the aim of the present article is to discuss some of the most important set of guidelines in designing a questionnaire.
Materials and methods: To fulfil the aim of the study, it has been tried to search the relevant literature by looking at different search engines and also carry out hand searching. It has also been tried to elaborate any selected guidelines by examples relevant to occupational epidemiology.
Results: The literature highlights that there are at the very least ten common-sense guidelines that one should take into account for designing a valid and reliable questionnaire.
Conclusions: By following the proposed guidelines it is hoped that a deigned questionnaire is able to elicit the responses that one might need.

Key words: Questionnaire, Design, Guidelines, Occupational Epidemiology

Introduction

There are diverse methods available to collect data in health research. However, the most common method in any area of human health research including occupational epidemiology is filling out a questionnaire. For example, when one sets out to gather relevant information on exposure assessment, the best way is to apply a valid and reliable questionnaire (1-5). Experiences suggest that in order to apply a questionnaire for collecting data one should consider some common-sense guidelines to obtain relevant information (6-13). Otherwise the gathered data is no more than a pile of unreliable and imprecise one. The aim of the present article is therefore to discuss some of the most important of these guidelines, taking into account the related issues within the area of occupational epidemiology.

Always in the first step, determine the aims of your study and formulate them into well-written questions or hypotheses

First and foremost you should determine the aims of your study. Then you should formulate those aims into well-written questions or hypotheses depending on the type of your study. For example, if your aims are achievable by descriptive epidemiological studies, e.g. you are going to estimate the prevalence of an occupational related disorder such as work-related

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musculoskeletal disorders (WMSDs) (14) then you should formulate your aims into answerable questions.

However, if your aims are achievable by analytic epidemiological studies, e.g. you are going to estimate the reasons behind an occupational related disorder, such as work-related disorders of neck and the upper limb (15), or the effect of psychosocial factors on WMSDs (16) then you should formulate your aims into testable hypotheses.

These are very important issues since clarification of aims and formulation of them into either answerable questions or testable hypotheses will help researchers to better define their targeted populations. It also helps them to exactly define those variables which should be collected from the population under study. These variables then carefully are converted into the questions of the research questionnaire.

Never commence to design a questionnaire before carrying out an extensive review of the literature

After completing the aims of your study, it is wise to carry out a wide review of literature before designing a questionnaire. The reason for this activity is that you may find an already designed questionnaire which fulfils your aims. You should always bear in mind that designing a standard questionnaire is a time consuming and difficult task. Therefore, if other people have already done this painstaking activity you would apply their questionnaire and save your time and energy.

Furthermore, using an already standard designed questionnaire will help you to compare your results with others whom have applied the same questionnaire before. It means that you also have a valid base for comparison purposes, which is an essential element in any scientific research.

Back to our previous example, if you are going to determine the WMSDs among the targeted population, by a wide extensive review of literature you will find that there are some previously validated questionnaires on WMSDs among different workers, such as physical therapists (17), athletic trainer (18) farm operators (19) and brick field workers (20). Most of these studies have applied a modified version of self-reporting Nordic Questionnaire, which is a standardized musculoskeletal questionnaire (21).

Similarly, suppose you are going to investigate occupational exposure to needle-stick injuries among medical and nursing staff, which is a universal problem (22-24). It is vitally important that you to recognize that there is an already standard questionnaire developed for this purpose (25).

Always apply a standard questionnaire

Irrespective of applying an already designed questionnaire or applying your own designed questionnaire, you should make sure that you utilize a standard one in your study. The term standard means that your questionnaire must be valid and reliable.

A valid questionnaire will measure exactly the topic under the study. For example, if you are going to measure work-related depression among the targeted population such as police officers (26) your questionnaire should measure depression and nothing else. A questionnaire that measures work-related anxiety (27) is not a valid questionnaire one for your study.

Moreover, a reliable questionnaire is a questionnaire that if it is carried out twice in a short period of time, say after one week on the same targeted population, it would give the same results. If your questionnaire does not encompass these two vital components, it is not a standard questionnaire. This implies

that by applying such a questionnaire in your study, you will only collect some deficient data.

As it has been mentioned earlier Nordic Questionnaire can be considered as a self-reporting standardized musculoskeletal questionnaire (21) in this regard.

Never use long questions and a long questionnaire

If you decide to design your own questionnaire you should never design long questions and apply a long questionnaire. Experiences show that a long questionnaire carries a high risk of non-responsiveness. Similarly, long and ambiguous questions within the questionnaire also carry the same risk. In order to get rid of such unwanted risks you should always consider some guiding principles in designing your questionnaire.

For example, always use simple and understandable words in your questions and only collect those variables that you vitally need. Similarly, never ask double-barreled questions (28). For example, instead of asking: "Have you ever experienced work-related anxiety or depression during the past twelve months?" you should ask two separate questions as follows: "1. Have you ever experienced work-related anxiety during the past twelve months?" and "2. Have you ever experienced work-related depression during the past twelve months?"

Always remember that designing a questionnaire is a tradeoff between "open ended" and "closed ended" questions

There are usually two types of questions used within a questionnaire i.e. "open ended" and "closed ended" questions. Designing a questionnaire is therefore, a tradeoff between these two types of questions'. "Closed ended" questions provide the necessary responses for the participants and they should only select the correct response. "Open ended" questions on the contrary, provide the necessary room for the participants to express their responses without any restrictions.

The analysis of "closed ended" questions is much easier and they are usually applied when the designer knows all the possible answers. The "open ended" questions are applied when the designer does not know all the possible answers and the analysis of this kind of question is a little awkward since the responses need to be grouped before any analysis is carried out.

However, all quantitative variables such as "age", "height", "weight" and "years of professional experience" should always be answerable as "open ended" questions. The reason for doing so is that you will be able to analyze them as real quantitative variables by calculating their measures of central tendency and spread, such as mean and standard deviation. Moreover, with the use of a user-friendly statistical package such as SPSS you will be able to group and re-group such variables based on the aim of your study.

Never begin your questionnaire with sensitive questions

The order of the questions within a questionnaire is also a vital issue that should be dealt with carefully. For a high rate of response never begin your questionnaire with sensitive questions. Sensitive issues change from one culture to another so you might need to be judicious in choosing the questions you might ask a particular cultural group.

For example, studying the issue of "sexual harassment" among workers (29) or students (30) could be categorized as a very sensitive

issue. Sensitive issues might be asked later in the questionnaire by explaining why these personal questions are important to be asked**.**

Always use an introductory paragraph in your questionnaire

An introductory paragraph is an essential part of any questionnaire which should help to increase the response rate. You might prepare this introductory paragraph in the format of an opening letter. In this introductory part you should introduce yourself and your research team. You should also explain the importance and aims of your study and provide the respondents with the necessary information on how to fill out the questionnaire.

You might also explain how the honest cooperation of the respondents is important for you to achieve the aim of the study. Additionally, you should always select a concise, attractive and comprehensive title for your questionnaire, avoiding any abbreviations and jargons.

Never end your questionnaire without acknowledging the respondents

Similarly, you should end your questionnaire acknowledging the cooperation of the respondents. They put in time and effort to fill out your questionnaire and therefore, you should express your gratitude. You should also tell your respondents what to do with the completed questionnaire and the closing paragraph is the best place for doing so.

Always use an attractive format for your questionnaire

If you have followed the previous steps in designing your questionnaire then you have nearly finished your highly difficult and complicated task. Now you should use an attractive format for the final draft of your questionnaire. Evidence suggests that an attractive format in terms of font type and size, questionnaire layout, the quality of paper and print and even the color of paper and print could have substantial effects on the response rate (31 & 32).

For ease of filling out, you might also categorize your questions under various sub-headings using bold sub-titles, according to the nature of your questionnaire. For example, the questions of a questionnaire on WMSDs might be categorized into the four following sections (33):

“Section A: Demographic characteristics”, “Section B: Occupational health”, “Section C: Perceptions on job risk factors that may contribute to development of WMSDs” and “SECTION D: Coping strategies toward reducing the risk of development of WMSDs”.

Never use your designed questionnaire without “pretesting” it

Pre-testing and pilot testing a designed questionnaire before actually using it for the targeted populations is an extremely advisable activity (34). To do so you might take some diverse strategies (35). For example, you might first ask your colleagues or some other experts in the area of study, to read through your designed questionnaire and provide you with some comments regarding quality and quantity of the questions.

Then you might ask some potential respondents to go through your designed questionnaire and determine any ambiguities. You might also ask the potential respondents about sensitive questions and how they feel about answering them.

These activities will help you to check your designed questionnaire to identify any parts

that need alteration. By revising your questionnaire based on the received comments you are now coming to the end of your intricate and complicated task.

Conclusion

Applying a questionnaire is the most common method of collecting data in any area of human health research. The present article provided some common-sense guidelines to make the most of a questionnaire.

Conflict of interest: Non declared

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