Developing potential indicators to evaluate medicines reconciliation at admission to hospital

Introduction

The quality of healthcare services has been one of the most important concerns of governments, healthcare institutions and staff, as well as patients themselves and their relatives[1]. It has been defined as maximizing the patients' comprehensive measures of welfare, taking into account the balance of expected gains and losses in each healthcare process[2]. Evaluating quality of care is essential in any consideration of redesigning, restructuring, modifying or improving practice by introducing new policy and procedures[1;3].

Medicines reconciliation has been defined as the process of obtaining an up-to-date and accurate medication list that has been compared to the most recently available information and has documented any discrepancies, changes, deletions, or additions resulting in a complete list of medications that is accurately communicated[4]. Medication discrepancies, which include any differences between medicines use history and the prescription of medication at admission[5], are one potential cause of medication errors and of patient harm. There have been increasing efforts to prevent or at least minimize these discrepancies by implementing medicines reconciliation in order to obtain an up-to-date and accurate medication list[4].

The NICE/NPSA report recommends that all healthcare organisations admitting adults should put policies in place for medicines reconciliation on admission[6]. They further recommend healthcare institutions to use indicators, audit tools and patient safety incident reports to monitor these actions.

Indicators have been defined as an objective measure of either the process or outcome of patient care in quantitative terms[7]. The model for quality improvement consist of structure, process, and outcome[2].

The nominal group technique has been selected to generate ideas about potential indicators to evaluate medicines reconciliation. It also used to ensure generating more practical ideas about potential indicators from practicing hospital pharmacists. Hospital pharmacists are expected to generate valuable practical ideas using their professional experience. The generated ideas will be grouped with other preliminary indicators developed from the literature, guidelines and reports to develop a final set of potential indicators that will be validated using the Delphi technique (see figure 1).

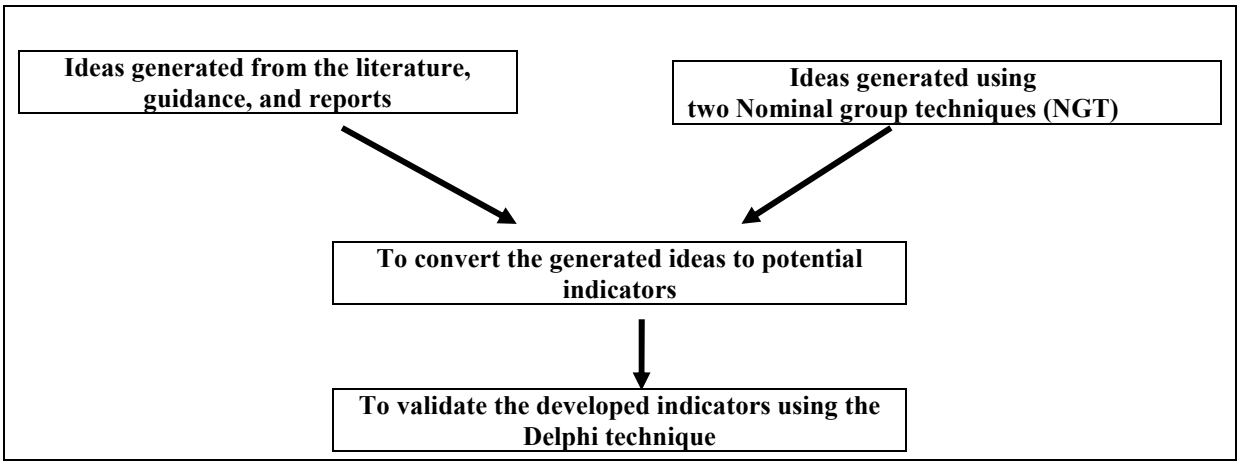

Figure 1: The approach of developing quality indicators

The aim

The aim of this study is to generate ideas about potential indicators to evaluate medicines reconciliation at admission to hospital.

Objectives

1- To use the nominal group technique to generate ideas about potential indicators to evaluate each step and the entire medicines reconciliation process.

2- To convert the generated ideas into potential indicators that could be validated using the Delphi technique.

Methods

Piloting the NGT process

The NGT study was piloted to give the facilitator experience in managing the process as well as the group. It also provided better understanding of domains or issues that might require more time as well as the overall time that might be required to complete the task. It was thus intended to give the facilitator the confidence in running the group, managing the time and complying with the structure of the NGT. The NGT is a structured method and the outcomes of the study are expected to depend on adherence to the original structure. Therefore, it has been suggested that the process should be piloted[8;9]. The piloting phase included the piloting of the research question, to ensure clarity and practicality. The NGT process was then piloted with the participation of practicing clinical staff of the Drug Usage and Pharmacy Practice who met the inclusion criteria.

Selection of experts

The panel was consisted of hospital pharmacists, because the formal medication history in most UK hospitals is taken by hospital pharmacists as part of their patient review to ensure the accuracy of prescription[10]. According to studies conducted in the UK, hospital pharmacists are the most experienced in taking medication history.

An invitation letter was sent to a list of 17 and 12 pharmacists to participate in the 1st and 2nd NGT respectively. They were either work full time or part time as hospital pharmacist. The invited pharmacists are working in hospitals limited geographically to the Greater Manchester to limit the cost of travel and the time required. The day and time of the meeting were selected to be convenient to the participants.

The panel size

It has been suggested that the NGT should not exceed 10 to 12 participants[11;11;12]. A small group size helps to control the participants and the process of the meeting. The most favourable sample size for NGT studies has been found to range from 5 to 9 participants[13]; these NGT groups 1 and 2 had a size consisted from 6 and 7 participants respectively.

Description of the NGT method

The NGT was conducted using conveniently sampled groups of experts. They must be practicing at least one day in hospitals. The 1st group was constituted from clinical tutors in the School of Pharmacy where the 2nd was constituted from practicing hospital pharmacists. Seventeen and twelve potential participants who fulfilled the inclusion and exclusion criteria were invited to participate in the study for the 1st and 2nd NGT respectively. Every potential participant received an e-mail which enclosed the NGT study invitation letter and an information sheet. Six (35.3%) and seven (58.3%) experts agreed to participate in the 1st and 2nd NGT respectively. They were sent an e-mail confirming the place and time of the group meeting, which enclosed the NPC five-minute guide to medicines reconciliation, together with brief information on the characteristics of good indicators. A reminder was sent to all potential participants two days before the meeting.

The facilitator opened the meeting by welcoming the participants and then gave a ten-minute presentation about the NGT, medicines reconciliation and the characteristics of good indicators. Participants were asked to comply with the structured design of the NGT and told that discussion was not allowed during idea generation. They were encouraged to generate new ideas silently during the round robin stage and informed that the discussion would be limited to clarifying the ideas generated.

The first step was the silent generation of ideas, which lasted for 20 minutes. In the round robin, every participant wrote his or her ideas in marker pen on A4 sheets, which were posted on a board. The assistant also typed the ideas into Microsoft Word documents to be shown to participants during discussion using a projector. The facilitator helped the participants to group the ideas according to the three steps of medicines reconciliation and the entire process.

After a ten-minute coffee break, participants discussed the generated ideas to clarify and omit the duplications. All the MR steps were discussed in this step. Both NGTs were audio-taped to be used as a reference during

developing the indicators. The quality of the two records was good. The NGTs were concluded with a final set of ideas.

Developing potential indicators from the generated ideas

Developing indicators is a complicated process that requires several considerations[3]. A systematic approach should be followed in the process of designing, appraising, and choosing indicators[1;3;7;14]. Criteria for good indicators were adapted to evaluate the developed potential indicators from three sources: a) Effective Practice Informatics and Quality (EPIQ), School of Population Health, Faculty of Medicine and Health Sciences, Auckland University, New Zealand[7], b) The Good Indicators Guide: understanding how to use and choose indicators published by the NHS Institute of Innovation and development, UK[14] and c- Quality in health care, a guide to developing and using indicators[3].

In the process of developing potential indicators, the statements were assessed using the criteria adapted from the previously discussed sources[3;7;14] which were used in the process of pre-piloting that was run to ensure a set of important, relevance, definable, clear, useful, meaningful, accessible, practical, and responsive to change (see figure 2). These criteria were used to critically appraise the developed indicators. These criteria are the most suitable for this stage to develop potential indicators. Criteria to develop operational definitions for the developed indicators were excluded in this stage to give chance for more indicators to be included in the validation phase. The process of developing operational definitions for the developed indicators will be addressed after the validation process.

Results

The literature review provided 40 ideas. The idea generation phase of the two nominal groups provided 143 ideas (66 and 77 ideas from 1st and 2nd NGTs respectively). However, the participants agreed after the discussion stage that only 36 ideas (from 1st NGT) and 34 ideas (from 2nd NGT) were suitable to be used as ideas about potential indicators to evaluate medicines reconciliation at admission to hospital. Other ideas were either deleted or modified to include other similar ideas. The discussion took about two hours in two different occasions in the 1st NGT because the discussion was permitted to include any relevant issues where the 2nd NGT took about 40 minutes.

Table 1 shows the number of ideas generated from literature and the two NGTs and the number of the developed potential indicators. Some of the generated ideas were supported by the potential indicators that already developed from literature, guidelines, and reports. The 110 generated ideas were converted to 119 potential indicators (42, 29, 25, 23 potential indicators for collecting, checking, communicating steps and the entire process, respectively).

Table 1: Number of ideas generated from the literature and the two NGT

Aspect of reconciliation	Number of ideas generated from literature and NGTs	Number of the developed potential indicators
Collecting information	39	42
Checking	28	29
Communicating	17	25
The entire medicines reconciliation process	26	23
Total	110	119

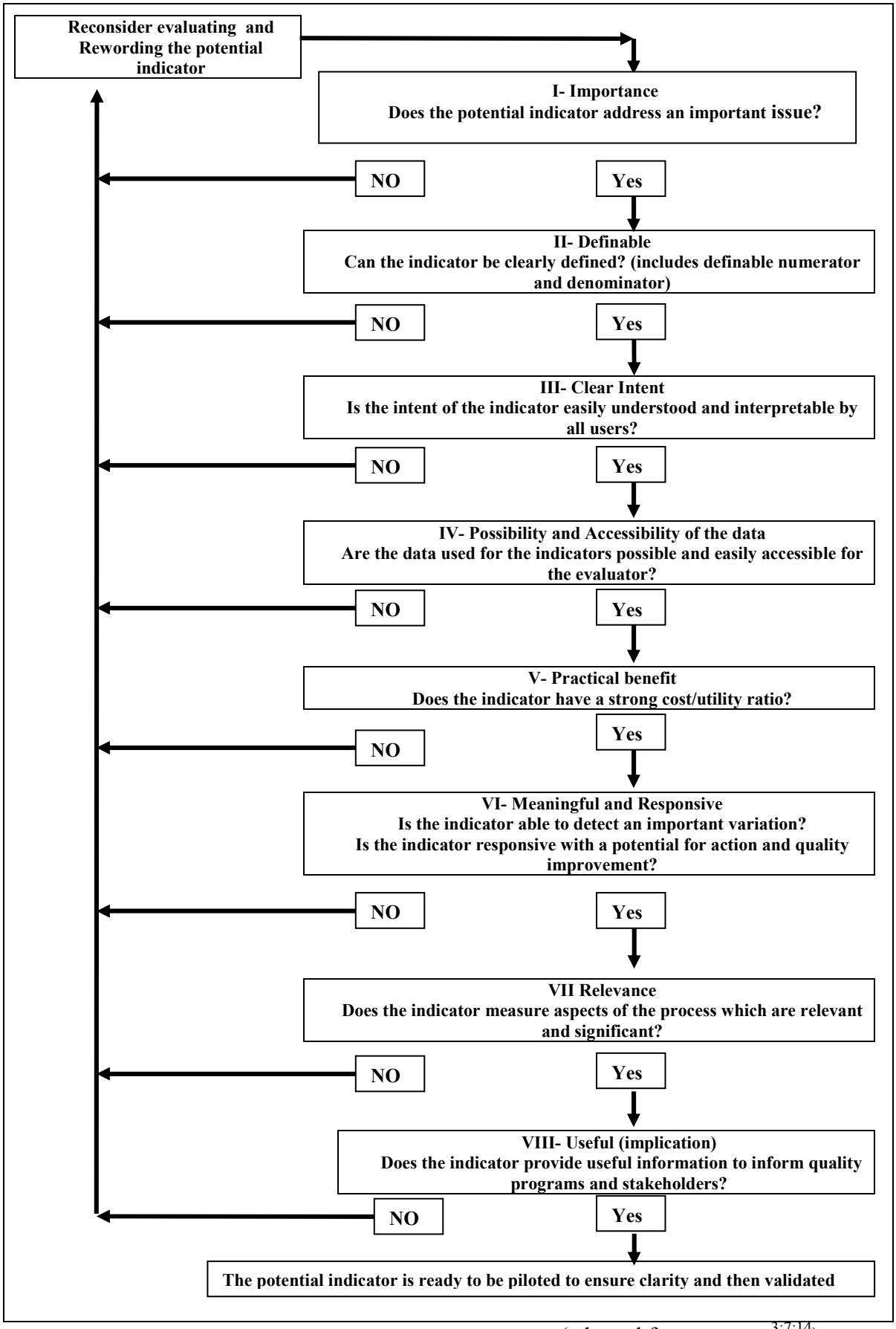

Figure 2: Flowchart for evaluating the developed potential indicators (adapted from sources[3;7;14])

Discussion and conclusion

Medicines reconciliation is a process of double checking what doctors prescribe to identify any possible discrepancies. It should be performed by other professions since double checking normally carried out by pharmacist, pharmacy technician, or nurses. Therefore, doctors were not considered experts in medicines reconciliation as they might have experience on drug history taking but not in the process of double checking and performing the three steps of medicines reconciliation. Nurses might have experience on taking drug history, however, the definition of expert that has been adapted in this study is those knowledgeable and experiences on performing the three steps of medicines reconciliation independently. This exclude nurses as they are not performing the three steps of medicines reconciliation either formally or informally. Pharmacy technicians perform part of the medicines reconciliation under the supervision of pharmacist. Pharmacists were considered the experts in medicines reconciliation because they perform the three steps of medicines reconciliation independently.

The two nominal groups and the literature review have generated a total of 110 ideas for potential indicators. These ideas were converted to 119 potential indicators using the previously described methods to develop good indicators (see figure 2). A process of pre-piloting was run to ensure a set of definable, clear, useful, accessible, practical, and responsive to change.

Participants in the 1st NGT were allowed to discuss any relevant issues such as definitions that include admissions, healthcare, and reconciliation where in the 2nd NGT the discussion was restricted on clarifying the generated ideas. Some practical issues were also discussed in the 1st NGT such as the time to complete medicines reconciliation, who should carryout medicines reconciliation, and the individual trust local standards for medicines reconciliation.

The developed potential indicators will be validated using by expert panel in medicines reconciliation in the UK using the Delphi technique. Once the indicators are validated, an operational definition will be developed for each one, including guidance on how to use them using the characteristics of good operational definitions (see box 1). Operation definitions are essential for a good measurement[3]. They are also critical to successful communication between individuals. This process is an important step in developing quality indicators and is intended to make the developed indicators more useful. An operational definition is defined as 'An operational definition is a description, in quantifiable terms, of what to measure and the specific steps needed to measure it consistently'[3]. The operational definitions will clarify the indicators developed, considering several essential characteristics: having communicable meaning, being clear and specific, enabling consistency in data collection and providing decision-making criteria when necessary[3].

This work is part of a process of developing performance indicators to evaluate the quality health care at admission at hospital. The developed potential indicators that would be validated and got operational definitions will be used to assess the quality of the process of medicines reconciliation at admission to hospital.

Box 1: Characteristics of a good operational definition:

1- Provide a communicable meaning to a concept or idea.
2- Clarify the indicators in clear and unambiguous words.
3- Specifies the measurement method.
4- Provide decision-making criteria.
5- Enable consistency in data collection.

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