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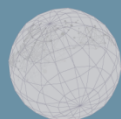
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Participatory design of impact indicators for nursing research[1]

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Introduction

The importance of understanding research impact and how research findings are translated into practice or put into action is widely accepted (Hanney & González-Block 2011). The term 'research impact' refers to 'any effect on, change or benefit to the economy, society, culture, public policy or services, health, the environment or quality of life' (HEFCE 2011) as a result of research activities.

As the Catalan research assessment agency, we designed and implemented an ongoing, ex-post and impact assessment system in the area of health system (SARIS). Because we learnt the importance of researchers' culture, values and leadership, as well as the rest of stakeholders around them, SARIS works very much around the stakeholders: their incentives, motivations, engagement, understanding needs, while giving to them some support. By stakeholders, we mean anyone who can provide or receive research value for a better health and sustainability of the health system.

Number of publications, thesis, patents… there are many indicators than can be used to assess the impact of research. Most of them are related to academic research, but others have been developed to assess and communicate the value of biomedical research (Guthrie et al. 2017). However, how can we know which ones are interesting or applicable to every case?

Recent evidence about the responsible use of indicators have been published. They include recommendations on the responsible use of indicators and take into account the negative incentives that can be generated. On one hand, the 'Leiden Manifesto for research metrics' (Hicks et al. 2015), which elaborates ten principles that can be taken into account in the evaluation of research, helping in the development of science and its interactions with society. On the other hand, the 'Metric Tide' (Wilsdon et al. 2015), a review that takes a deeper look at potential uses and limitations of research metrics and indicators, including the evaluation of its potential contribution to the development of the excellence and impact of the research.

One of the key aspects to consider making a responsible use of indicators implies mission-oriented assessments. That means that the selected indicators should be clearly related to the

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goals and context of the program evaluated. This is a key point because no single evaluation model applies to all contexts (Hicks et al. 2015). Although some indicators may be considered very relevant in some cases, they may not be equally relevant to other stakeholders. Continuous reflection on the reasons for selecting one or other indicators helps to analyse and refine the evaluation.

Apart from that, the success of the assessment systems depends on the acceptance of their processes and results among those responsible for the decision-making and the research communities that are evaluated. For this reason, potential indicators must be verified and agreed in collaboration with the different stakeholders involved.

Research impact assessment studies show that in order to achieve more impact, engaging with stakeholders early and throughout the assessment's process can help ensure its robustness (Adam et al. 2018). What is shown in these studies is that engagement of different stakeholders throughout the process can help to improve its effectiveness and to facilitate a more effective translation into practice (Solans-Domènech et al. 2013). Therefore, an effective and comprehensive approach in engagement and communication with and for stakeholders is a crucial facilitator of research impact. Additionally, engagement has been conceptualized as a way to increase the capacity and disposition of the stakeholders to use the results (Wooding et al. 2014).

Engagement is a crucial pillar of SARIS, which, together with the analysis and the accountability, should lead to an improvement on impact of Catalan research. Moreover, here is where the learnings from research impact assessment are applied in practice.

The main objective of this study is to co-create a list of impact indicators for nursing research with nurses who do research. In the present work, we developed an approach that combines the participatory design with stakeholders in order to define topics of interests related to nursing research impact with the formulation of indicators that will be ultimately evaluated through a structured consensus method. Our aim here is to present just the first part, which is to define the topics of interest in order to assess the impact of research in the context of nursing, and to draft preliminary indicators. Next steps will include the consensus in order to assess the relevance of the preliminary indicators.

Methodology
Using a 2-phase approach, preliminary indicators to evaluate the impact of nursing research were developed.

Phase 1. Defining topics of interest in relation to nursing research impact
Three focus groups with the main purpose of identifying topics of interest in relation to the impact of nursing research were developed. One member of the research team, which stimulated discussion among them, facilitate the focus groups.

Our context is nursing research grant holders of the Health Research and Innovation Strategic Plan (PERIS) of Catalonia. In order to capture all aspects of nursing research, all the beneficiaries of the PERIS intensification grant (n=62) were invited to participate in the focus groups. The beneficiaries are nursery professionals carrying out clinical assistance activities who were funded to develop research activities for a short period (from three to nine months). The purpose of this call is (a) the promotion of health care professionals who simultaneously carry out activities of research; (b) the encouragement the participation of nursing

professionals in research activities in Catalonia; and (c) the promotion of research oriented to care and / or nursing care processes. Focus groups were organised just after the grant finished. In order to make a bottom up brainstorming of topics of interest, focus groups were divided in two stages. At the first place, the session facilitator asked the participants to review the applicability of their own research and what impact they expected within a year. The answers of these questions allowed to rise to the surface what kind of outcomes beyond academy could research have. At the second place, the discussion was focused on describing different initiatives nurses that could done during the next year in order to promote impact out of academia of their own research.

Phase 2. Development of preliminary indicators to measure the value of nursing research
Impact indicators were defined according with the polling of information of the focus groups. The suggested ideas from the focus groups were analysed by the research team individually. All the researchers read all of the notes to gain an overview. Topics with similar concepts were grouped on different categories. For each category, the emerging indicators were defined. Finally, both researchers discussed the results of the individual analyses, and a consensus about categories and preliminary indicators was reached.

Findings
Phase 1. Defining topics of interest in relation to nursing research impact
Twenty-seven nurses (44%) participated in the focus groups. Eighteen were women and nine were male. The focus groups included participants form different settings (hospital and primary care), territories (Catalan regions) and disciplines (mental health, urgent care, cancer, etc.). On average, the length of the face-to-face discussion groups was 1.5 hours.

During the analyses, four topics of interest emerged: 'advancement of knowledge', 'results dissemination', 'nurse training and networks' and 'results application'. 'Advancement of knowledge' captures the direct development and outputs arising from the research. 'Results dissemination' captures the interactions with different stakeholders. 'Nurse training and networks' captures the development and enhancement of research skills in individuals and teams as well as the construction of research networks and measures of prestige. It therefore takes into account activities that encourage, develop, support and/or enhance research skills. 'Results application' captures the influence and adoption of research results on routine care, management or behaviour.

The focus group also allowed determining the different stakeholders involved in nursing research impact (Figure 1). That is those people and organisations with an interest in the outcome of nursing research.

Figure 1. Stakeholders map resulting from the focus groups
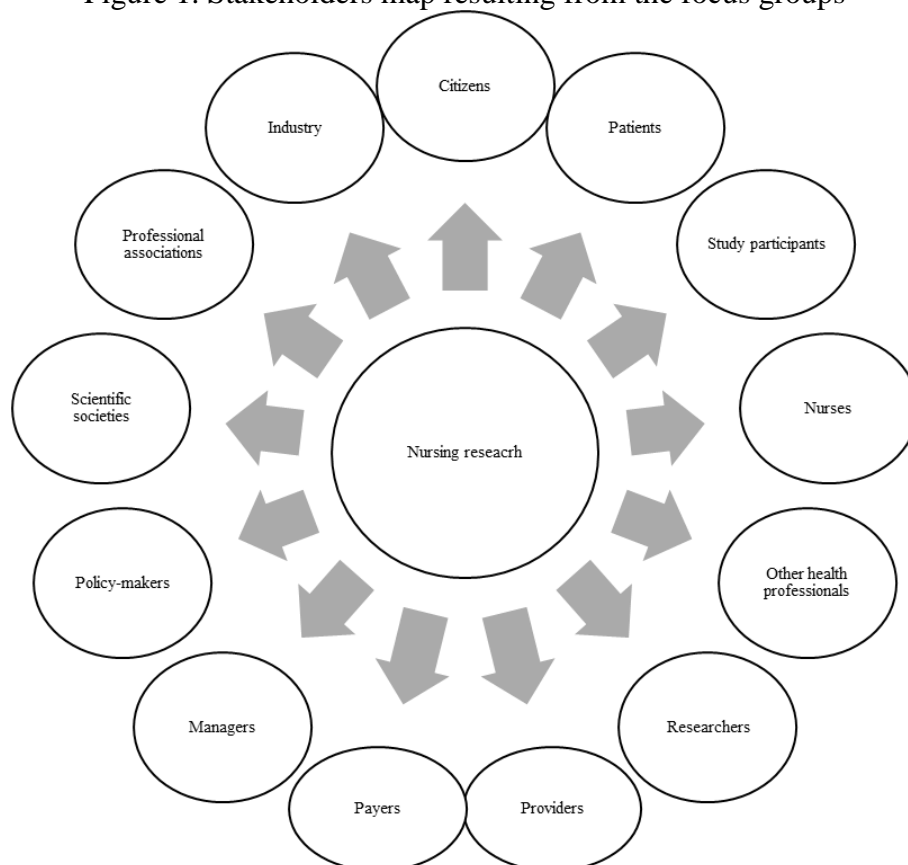
Phase 2. Development of preliminary indicators to measure the value of nursing research
Thirty impact indicators were defined as a result of the suggested ideas from the focus groups. Indicators were categorised into four different dimensions according to the four topics of interest emerged during the focus groups ('advancement of knowledge', 'results dissemination', 'nurse training and networks' and 'results application'). Every dimension has several subdimensions, in which indicators were grouped together (Table 1).

'Advancement knowledge', which refers to direct outputs from the research, includes number of publications and conferences attended; 'Results dissemination' includes productive interactions with societal stakeholders that may facilitate impact: from colleagues to policy-makers or patients. The concept of productive interactions acknowledges that in addition to scientists also actors external to science are fundamental in creating science's societal impact (Spaapen & Van Drooge 2011); 'nurse training and networks' includes indicators to measure collaborations (number of collaboration with national and international groups and formation of multidisciplinary teams). It also includes the capacity building of researchers, specifically whether the research was part of a completed PhD or not. Finally, jobs promotion due to the research done or the number of awards obtained are indicators categorised as a measure of prestige. 'Results application' includes indicators about care processes and nursing practice, patient satisfaction and policy impacts

Table 1. List of impact indicators resulting from the analysis of focus groups' ideas

Dimension	Subdimension	Indicator	N
Advancement of knowledge	Publications	Number of publications	1
	Conferences	Number of conferences attended	2
		Number of posters presented	3
		Number of oral communications given	4
Results dissemination	Productive interactions with other professionals (at workplace)	Number of seminars and/or clinical sessions	5
		Number of results presentations	6
		Number of meetings and/or working group	7
		Number of meetings and/or results presentations within hospital managers	8
	Productive interactions with other professionals (out of workplace)	Number of seminars and/or clinical sessions	9
		Number of results presentations	10
		Number of meeting and/or working group	11
		Number of meetings and/or results presentations within policy makers	12
		Incorporation into working groups within policy makers	13
	Productive interactions with patients and citizens	Number of informative conferences	14
		Number of patient meetings attended	15
		Number of materials published for patients (leaflets, videos, social networks ...)	16
Nurse training and networks	Team consolidation	Number of research lines created	17
		Number of research group set up	18
	Capacity	PhD completed	19
	Awards and prestige	Number and size of awards received	20
		Job promotion	21
	Collaborations	Number of collaborations within national research groups	22
		Number of collaborations within international research groups	23
		Formation of multidisciplinary teams	24
Results application	Care processes and nursing practice	Improved quality-of-care metrics	25
		Changes in the organisation planning, design or management of care	26
	Patient satisfaction	Improved health of patients	27
		Patient satisfaction	28
	Policy impact	Number of invitations from policymakers	29
		Number of citations in policy documents	30

Discussion

This publication explores the development of 30 preliminary indicators for measuring the impact of nursing research, considering the different topics of interest resulted from a co-creation process. The majority of the indicators are included in the topics of 'results dissemination' and 'nurse training and networks'. This is not a surprising result due to the fact that both of them are in the areas of interest of the nursing researchers. Two aspects were considered in order to develop the methodology: the context (nursing research) and the co-creation with other stakeholders than the traditional assessment agencies and policy-makers.

Assessment agencies have a standard protocol for the adoption of indicators: first, a search in the literature, second a categorisation of the identified indicators according to aspects such as relevance or feasibility, and third, the use of any available selection tool (usually checklists) to ensure a wise and balanced final set of adopted indicators. Examples of the selection tools or checklists are: *FABRIC*, standing for a set of indicators that are Focused, Appropriate, Balanced, Robust, Integrated, Cost Effective (HM Treasury et al. 2001); *SMART*, standing for Specific, Measurable, Attainable, Relevant, Timely (Doran 1981). Alternatively, indicator expert panels and Delphi surveys can be used to take into account the opinions of a diverse sample of experts in the selection of the best impact indicators and metrics. Involving lay members of the public, stakeholders, and research end-users in the development and selection of indicators can increase the social robustness of selecting indicators as well as provide a balance set of perspectives.

In this case, the strategy used is based in the hypothesis that by engaging the stakeholders that will be measured with the definition of the impact metrics will 'motivate' them to reach this impact, and thus to accomplish successful results in the measure itself.

Conclusion

In the current context, where research in nursery care has not been measured before, this might be a win-win strategy to reach three objectives: 1) obtaining a meaningful and measurable set of indicators, 2) raising awareness on the transformative potential of nursery care research, and 3) in motivating researchers in nursery care to maximise the impact.

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