Promoting development and use of systematic reviews in a developing country

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Abstract:

Introduction:
One major barrier to develop health systems is the limited capacity for conducting research and implementation of research findings. We assessed the views of researchers, decision-makers, and research policy-makers on how the development and usage of evidence from systematic reviews can be promoted in a country with limited resources.

Methods:
We surveyed 131 participants in six systematic review workshops for their views on important items influencing the production and usage of systematic reviews in a developing country. They were also asked to propose interventions to deal with potential barriers. We analyzed the quantitative data using multidimensional scaling methods, and the qualitative data using content analysis approach.

Results:
We identified seven clusters of items that contribute to the promotion of conducting and using systematic reviews. For each cluster a set of interventions are proposed that healthcare decision-makers and research policy-makers may use for promoting conduct and use of systematic reviews. The clusters are “importance for policy makers”, “access to international research”, “priority and support for systematic reviews”, “competency and willingness of researchers to
conduct reviews”, “importance for end-users”, “quality of local primary research” and “visibility and access to local research”.

Discussion: The proposed interventions focus on national level initiatives for making the systematic reviews ‘wanted’ and improving the capacity to conduct research. Our findings emphasize the essential role of policy makers for promoting systematic reviews. They demonstrate that many barriers stem from the lower quality of and lack of access to primary research originating from developing countries.
Introduction:

It has been argued that even in resource poor countries evidence based medicine (EBM) is helpful and essential [1-3]. “It is exactly this desperate situation that justifies the need for evidence-based medicine” [1].

One major barrier in many developing health systems is the limited capacity for conducting research studies and dissemination and implementation of research findings [4,5]. The capacity issue warrants specific attention to priority setting for research [5] and further use of methods such as systematic reviewing of evidence which are more capable of providing high quality evidence for action.

Call for further use of systematic reviews in developing countries [2] and making the reviews more accessible to developing countries [6] are not new. Still we do not have enough reviews that are relevant to the needs of developing countries. Several interventions are being recommended to improve this situation [3].

Some interventions originate from the position of how to make the current pool of systematic reviews more accessible for use in developing countries, e.g. by conducting and reporting systematic reviews in a way that is more useful for developing countries [3]; in other words, asking investigators from resourceful countries to develop evidence in a way that is more beneficial to health systems.
with limited resources. Other recommendations include facilitating further access
to systematic reviews (including Cochrane reviews) [7], direct support from
Cochrane entities and the ‘developed world’ for capable investigators in
developing countries so that they can generate the evidence required for
decision making in developing countries [8], and facilitating registration of
systematic reviews and participation of authors from developing countries [3].

These recommendations are valuable and have their own merits. Lansang et al
emphasized that the appropriateness of a model for capacity building in research
depends on the maturity of the research system in a given country [9]. In other
words, interventions generated in a ‘bottom-up’ approach could be more relevant
and applicable for: promotion and conduct of systematic reviews in developing
countries, improving methods to enable better use of data from developing
countries in systematic reviews, and improving the capacity for use of relevant
high quality evidence from systematic reviews in developing countries.

We aimed to assess the views of researchers, health policy and decision makers,
and research policy makers and support staff on how the development and
usage of evidence from systematic reviews can be promoted in a country with
limited resources.
Methods:

**Design of the questionnaire**

Seven researchers involved in teaching and conducting systematic reviews participated in a brainstorming panel. The panelists were familiar with the current literature on the issue. A list of items that potentially influenced attitude and behavior towards producing and using systematic reviews were proposed. The panelists reviewed the list and improved the wordings and contents to maximize the transparency and face validity of the items. The final questionnaire included 20 items. We asked the participants to select five important items from the list and suggest interventions that could be used for dealing with the selected items.

**Conducting educational workshops and data collection**

We conducted six three-day systematic review methods workshops for researchers, national and academic decision-makers. The workshops used a combination of lectures and small group hands-on exercises, in which the participants performed ‘their own’ systematic reviews by practicing what being taught in lectures. The workshops’ aim was that the participants should be able to design a systematic review, develop the protocol, and manage different steps in conducting a systematic review and be able to get objective consultations for literature search, quality appraisal and analysis phases of the review.

The workshops were targeted at different audience groups:
• Three workshops for clinical and health care researchers (Group 1)
• Two workshops for deputies of research affairs of Iranian medical universities and their information and research managers (Group 2)
• One workshop for health managers and investigators from the ministry of health (Group 3)

We distributed the self-administered questionnaires in each workshop and collected them at the end of the workshop.

**Analysis**

The percentage of workshop participants who chose each item were calculated totally and for three groups of workshops and in total. The percentages among groups were compared using Chi-square test and the p-values less than 0.01 were considered statistically significant.

Multidimensional scaling (MDS) method was used to build a similarity matrix of the items based on their similarity in being chosen by the participants as important items, using Euclidian distances in non-metric MDS [10]. The number of dimensions was limited to two. The resulting ‘map’ of the points represented the best approximation of the similarity matrix. XY coordinates for each item on the two-dimensional map were used as the input for the hierarchical cluster analysis, with Ward’s algorithm [11]. Two authors reviewed the dendrograms of cluster analysis and the two-dimensional similarity map to define meaningful
clusters of items. We used simple content analysis approach to synthesize the interventions suggested by the respondents.
Results:

In total 131 participants out of 150 returned the questionnaires.

Items

Table 1 demonstrates the percentages of respondents who chose each item. The items “willingness and competency of health policy makers to use systematic reviews”, “competency of researchers in conducting systematic reviews”, “access to international databases”, and “training of professional methodologists in the systematic review related fields” were the most frequently selected items.

Clusters of items

The two-dimensional map of items is shown in Figure 1, with each item represented by its code. Items positioned closer to each other on the map were judged to be more similar (model goodness of fit: stress value=0.34 [12]). The authors discussed the map and the cluster analysis output (the dendrogram; not reported here), clustered the items based on their visual proximities and the conceptual similarities, and gave labels to each cluster which could more meaningfully explain the cluster content (Figure 1 and Table 1). Four clusters were readily identifiable on the map. Three further clusters ‘importance for end-users’, ‘visibility and access to local research’ and ‘quality of local primary research’ were conceptually defined by the authors, because their containing items were too close to be discriminated by the MDS method.
Cluster description and suggested interventions

Importance for policy makers. This cluster included one item (‘willing and competency of health policy makers to use systematic reviews’). It received the highest level of support (Table 1). This support was statistically higher among the Group 3 participants. Some participants mentioned it is difficult to change the policy makers’ attitudes. Participants suggested teaching about systematic reviews, presenting selected successful and unsuccessful policies, and presenting selected important systematic reviews to policy makers may change their attitudes towards evidence based decision making.

Access to international research. This cluster included items ‘access to international databases’ and ‘access to the full-text articles published in international journals’. The items were selected by over 35% of the participants. Respondents highlighted the need for raising funds for purchasing access to international databases. Involvement of librarians and health information management specialists in research policy making was suggested as a solution. Nevertheless, providing access without practical education on how to use databases was considered ineffective. Establishment of a national portal for expansion of access to international information sources was suggested by some participants while they disagreed on the level of access (all interested users, all university affiliated researchers, or exclusive to the ministry).
Priority of and support for systematic reviews. This cluster included items ‘relative importance of systematic reviews in comparison with other study types’, ‘setting the subject priorities for conducting systematic reviews’ and ‘raising funds for conducting systematic reviews’. Respondents suggested giving higher scores to performing systematic reviews in assessment and promotion of faculty members. Provision of national grants and ring-fenced research funds, and considering systematic reviews as higher priority research by research councils were proposed as possible interventions. It was suggested that the ministry of health should announce the research priorities to be addressed using systematic reviews.

Competency and willingness of researchers to conduct systematic reviews. This cluster included items 4, 7, 8, 14, 19, and 20 (Table 1). Items ‘competency of researchers in conducting systematic reviews’ and ‘training of professional methodologists in the systematic review related fields’ received considerable support.

Reviewer training courses should be extended to the national level and target different groups from researchers to university faculties and journal editors. Some suggested this training should even be mandatory for all information specialists. The respondents mentioned that the methodology of systematic reviews should be covered in the master of public health and research degrees curricula. Some respondents suggested that since the topic is relatively new in
Iran, talented students should be provided by bursaries to attend relevant courses abroad.

Others suggested that new journals should be published which are specialized on the topic. Others suggested that, when considering the publication of a primary research article, editors should take into account whether the authors have cited or performed a systematic review indicating the need for the study to be undertaken.

**Importance for end-users.** It included one item: ‘willingness and competency of health care providers to use systematic reviews’. Some respondents suggested that introduction to systematic reviews to be added to the general and postgraduate educational curriculums of health care providers.

**Quality of local primary research.** The cluster included items ‘quality of conduct and reporting of local primary research’, ‘validity and reliability of data collection tools in local primary research’ and ‘reporting quality of findings of local primary research’. The items focused on the fact that the quality and usefulness of systematic review is directly dependant upon the quality of the primary research used in the review.

Proposed strategies included the (mandatory) education of research methods to ‘researchers’, consultation and support in methodology and scientific writing, and further involvement of professional methodologists in research teams.
Using data collection tools with unknown validity was considered as an important barrier to the usefulness of local primary research in systematic reviews. Explicit quality control mechanisms for research tools and establishment of a national bank of valid tools in local language were also suggested.

**Visibility and access to local research.** This cluster included four items concerning ‘indexing’, ‘searching’, and ‘access to published’ and ‘unpublished’ local research (Table1). The respondents highlighted the need for promoting indexing of local journals in international databases. Two pre-requisites for greater international visibility of local journals are improvements in reporting, editorial processes, and presentation of local journals, and setting harmonized national minimum standards for reporting of research to be observed by all local journals. In parallel, the coverage and searching quality of databases of papers published in local language should be improved. Some respondents suggested the establishment of a single national database for research registration (including theses, ongoing studies, published articles, and organizational reports), and some emphasized the need for technical and professional support to improve currently available databases. Any national coordinating effort warrants participation and partnership between governmental, academic and non-governmental organizations. The initiation and running of these national projects was considered the responsibility of the research deputy of the ministry of health, although some participants believed in an indirect responsibility for the ministry and supported outsourcing of such services to private sector.
Discussion

Our study identified seven clusters of important items that may contribute to the promotion of conducting and using systematic reviews in a developing country. Each cluster comprises of one to six items (Table 1). For each cluster we also identified a set of interventions that decision makers and research policy makers in developing countries may use for promoting conduct and use of systematic reviews. We conducted our study in the context of a capacity building exercise in which methods of appraising and conducting systematic reviews were taught to individual researchers, policy makers and research managers in Iran.

Our findings put strong emphasis on the views of policy makers for promoting this type of research in a developing country. In the literature this is known as the ‘pull efforts’ [13]. Another cluster is about access to international journals (as a prerequisite for conducting proper systematic reviews), similar to previously published recommendations [1,8]. Interestingly, two clusters are concerned with the quality and the visibility of local primary research. They emphasize the fact that many of the barriers towards the promotion of systematic reviews in developing countries stem from the quality of primary research generated from these countries. A further cluster is focused on the competency of local investigators. Increasing competency of developing country investigators is a challenge. Others have recommended that methods of conducting systematic
reviews should be incorporated into evidence-based practice training courses [14].

Our findings also include interventions that the participants recommended for addressing the challenges ahead of promoting conduct and use of systematic reviews of evidence in developing countries. Several recommended interventions involved national and multi-disciplinary approaches for improving infra-structure and capacity for research in the country.

Our approach had advantages over previous studies. First it was primarily based on the views of those at the first line of conduct and support for systematic reviews as well as those charged with the use and implementation of the best available evidence in national decision making. Second, most of previously recommended interventions focused on how to make systematic reviews conducted in developed settings more relevant to developing countries and how to increase the share of systematic reviewers from developing countries in Cochrane activities [7,8]. The added value of our study is that it focuses on endogenous approaches towards promotion of systematic reviews in a developing country, i.e. how to make the systematic reviews ‘wanted’ in a country, and how to improve the capacity in a developing country to conduct more research using its own resources. Another advantage was the use of objective quantitative methods for identifying clusters, and simple content analysis approaches for collating the interventions.
White (2002) recommended that research capacity building will be successful if it is “from the ground up” and insisted that proper management of the research is an essential factor in developing the capacity for research [15]. Others have put forward similar arguments [9,16]. In our study the respondents focused not only on the issues of the capacity to conduct the research but also on interventions for improving management and use of research.

Our study has some limitations. The sample, although representing the main target groups, was not representative of target populations. The participants were those attending systematic review workshops. This may explain why more attention was paid to the conduct of reviews than to the use of reviews in decision making. As the sample size is relatively small, significance tests should be interpreted with caution. Also we generated the original items in brainstorming exercises. More objective approaches might have offered further valuable insights. Another limitation is that the study does not focus on the practical barriers from the experienced reviewer’s point of view. Most of the participants, although experienced in some research methods, were novice in conducting systematic reviews. This, on the other hand, might make the results more relevant as many developing countries have similar situation. Further study in this area might attempt evaluation of the clusters in real settings to assess their relevance and validity.
Acknowledgement:

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Authors’ contributions:

Devise of the study, questionnaire development, and conducting the survey: all authors; data analysis: RYN, AR, SN, SMH, HS; interpretation of the findings: AR, RYN, SRM; writing and revising the manuscript: AR, RYN; commenting on the drafts: SRM, SN, SMH, HS, AE.
Statement of conflicts of interests:

The authors teach and conduct systematic reviews as part of their professional activities. We have no other conflicts of interests.
References:

1. Dans AL & Dans LF (2000) The need and means for evidence-based medicine in developing countries. Evidence Based Medicine, 5, 100-101


Table 1: The list of clusters and items affecting the promotion of conduction and usage of systematic reviews in a developing country and the percentages of the participants who selected them as important

<table>
<thead>
<tr>
<th>Importance for policy makers</th>
<th>Group1</th>
<th>Group2</th>
<th>Group3</th>
<th>total</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Willing and competency of health policy makers to use systematic reviews</td>
<td>43</td>
<td>23</td>
<td>78</td>
<td>42</td>
<td>&lt;0.0001</td>
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<td>Access to international research</td>
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<tr>
<td>9. Access to international databases</td>
<td>44</td>
<td>32</td>
<td>52</td>
<td>41</td>
<td>0.2</td>
</tr>
<tr>
<td>10. Access to the full-text articles published in international medical journals</td>
<td>28</td>
<td>38</td>
<td>48</td>
<td>35</td>
<td>0.2</td>
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<tr>
<td>Priority of and support for systematic reviews</td>
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<tr>
<td>3. Relative importance of systematic reviews in comparison with other study types</td>
<td>25</td>
<td>27</td>
<td>18</td>
<td>24</td>
<td>0.6</td>
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<tr>
<td>5. Setting the subject priorities for conducting systematic reviews</td>
<td>30</td>
<td>28</td>
<td>35</td>
<td>30</td>
<td>0.8</td>
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<tr>
<td>6. Raising funds for conducting systematic reviews</td>
<td>31</td>
<td>26</td>
<td>13</td>
<td>26</td>
<td>0.2</td>
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<tr>
<td>Competency and willingness of researchers to conduct systematic reviews</td>
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<td>4. Attitudes of researchers towards conducting systematic reviews</td>
<td>20</td>
<td>34</td>
<td>13</td>
<td>24</td>
<td>0.09</td>
</tr>
<tr>
<td>7. Competency of researchers in conducting systematic reviews</td>
<td>41</td>
<td>55</td>
<td>13</td>
<td>41</td>
<td>0.003</td>
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<tr>
<td>Competency of information specialists (librarians,…) in searching</td>
<td>26</td>
<td>19</td>
<td>17</td>
<td>22</td>
<td>0.6</td>
</tr>
<tr>
<td>14. Coverage of the local primary research topics to answer questions of systematic reviews</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>0.9</td>
</tr>
<tr>
<td>19. Training of professional methodologists in the systematic review related fields</td>
<td>43</td>
<td>45</td>
<td>30</td>
<td>41</td>
<td>0.5</td>
</tr>
<tr>
<td>20. Attitude of the local journals’ editors towards systematic reviews</td>
<td>10</td>
<td>13</td>
<td>0</td>
<td>9</td>
<td>0.2</td>
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<tr>
<td>Importance for end-users</td>
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<td>2. Willingness and competency of health care providers to use systematic reviews</td>
<td>26</td>
<td>17</td>
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<td>Quality of local primary research</td>
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<td>15. Quality of conduct and reporting of local primary research</td>
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<td>Validity and reliability of data collection tools in local primary research</td>
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<td></td>
<td>Reporting quality of findings of local primary research</td>
<td>15</td>
<td>17</td>
<td>17</td>
<td>16</td>
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</table>

**Visibility and access to local research**

<table>
<thead>
<tr>
<th></th>
<th>Indexing of local articles in international databases</th>
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<tr>
<td>11</td>
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<td>13</td>
<td>15</td>
<td>9</td>
<td>13</td>
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<tr>
<td></td>
<td>Quality of searching and coverage of local databases</td>
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<td></td>
<td>Access to the full-text articles published in local medical journals</td>
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<td></td>
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<td>Access to the reports of research performed by organizations</td>
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<td>18</td>
<td></td>
<td>8</td>
<td>11</td>
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<td>14</td>
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</table>

The percentages are shown for each group of workshops and in total. The items are divided by the conceptual clusters (see methods). The bold numbers are three highest percentages in each column. The statistical significance of the percentages between groups are provided.

Figure 1: The two-dimensional proximity map of the items and the final borders of clusters