




## Adaptation Frameworks for Clinical Guidelines and Proposing a Framework for Iran: A Review and Comparative Study

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### Abstract

**Background:** Clinical Practice Guidelines (CPGs) can be adapted to local conditions to prevent any resources from being wasted. Adaptation of CPGs implies a systematic view of developed guidelines through maintaining evidence-based principles in order to find the ones most relevant with patients' conditions and its integration with the cultural and regional requirements of the target population and health system facilities. The main purpose of the study was to describe, interpret and compare different frameworks for adaptation of clinical guidelines and proposing a comprehensive framework for Iran.

**Methods:** This study was based on a review and comparative analysis of adaptation frameworks of CPGs. Initially, all adaptation frameworks were collected by systematic search in the literature. We searched the following electronic databases: PubMed, Scopus, Trip Database, Science Direct, and Google Scholar. Then, based on the stages of the comparative study, frameworks were described, interpreted, juxtaposed, and compared. Finally, a comprehensive framework for the adaptation of clinical guidelines was proposed by consulting a panel of experts.

**Results:** Our literature search resulted in 26 frameworks, of which 18 were potentially relevant. Based on inclusion/exclusion criteria, nine frameworks were included in the study and have been described, interpreted, and compared. The proposed comprehensive framework for the adaptation of clinical guidelines consists of ten main steps.

**Conclusion:** The proposed comprehensive framework is an appropriate tool for the adaptation of clinical guidelines in Iran that can be used in other countries. However, further validation of the framework requires case studies and expert consultation to determine its application to the adaptation of clinical guidelines.

**Keywords:** Clinical Practice Guidelines, Adaptation, Framework

**Conflicts of Interest:** None declared

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### Introduction

The first definition of clinical practice guidelines (CPGs) was provided by the Institute of Medicine (IOM) in the United States in 1990: "Structured advice that helps physicians and patients make informed decisions about coping with a particular clinical condition" (1). Since the 1990s, global clinical guidance initiatives have increasing-

ly grown. This definition, though, was revised in 2011: "Statements which contain recommendations made by systematically reviewing the evidence and evaluating the advantages and disadvantages of alternatives for optimizing patient care" (2). The CPGs are considered one of the effective tools for the promotion of evidence-based medi-

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#### ↑What is "already known" in this topic:

Previous studies have investigated the advantages and limitations of the guideline adaptation frameworks.

#### →What this article adds:

In this study, we reviewed, described, interpreted, and compared different frameworks for the adaptation of clinical guidelines. The comprehensive framework proposed in this study is an appropriate tool for the adaptation of clinical guidelines.

cine (EBM) (3). Clinical guidelines play an important role in improving service quality and reducing health costs. Clinical guidelines provide an opportunity to improve the quality of care by reducing the variety of treatments and adhering to good care standards rather than being just a tool to control physicians (4). They can be used in a wide range of effective and efficient health care situations such as introducing new methods or services, promoting effective primary or secondary health care, encouraging the acceptance of cost-effective interventions, and improving patient scheduling and discharge processes (5).

There is a growing understanding that it is not possible to develop a national guideline for every health problem (6). Development of an evidence-based guideline requires considerable time, expertise and financial resources (7-9). Existing clinical guidelines can be adapted to local conditions to prevent rework and waste of resources (10). The adaptation of CPGs has been developed in the sense of a systematic view of CPGs, which maintain evidence-based principles and come up with the most relevant ones to patients' conditions and integrate them with the cultural and regional requirements of the target population and health system facilities (11). In other words, "guideline adaptation is a process in which existing guidelines are modified to reflect the local situation so that they can be used within a different care setting" (12).

It is evident that clinical guidelines improve the quality of health services (4, 13, 14), reduce medical errors (15), and increase patient safety (16), as well as cut the expenses on additional diagnostic and treatment costs (17). However, the adaptation or adoption of clinical guidelines in Iran has not been properly implemented and has come across some challenges such as lack of a comprehensive and acceptable framework for the adaptation of clinical guidelines. Obviously, a fundamental step can be taken by analyzing different frameworks in the world and, simultaneously, criticizing the existing methods of adaptation of clinical guidelines to accelerate the solution of problems in the field of adaptation of CPGs. Therefore, the aim of this study was to describe, interpret and compare different frameworks for adaptation of clinical guidelines and to propose a comprehensive framework for Iran.

## Methods

This study was based on a review and comparative analysis of adaptation frameworks of CPGs. Initially, all adaptation frameworks were collected by systematic search in the literature. Then, based on the stages of the comparative study, frameworks were described, interpreted, juxtaposed, and compared. Finally, a comprehensive framework for the adaptation of clinical guidelines was proposed by consulting a panel of experts.

### Literature Search and Eligibility Criteria

The systematic search in the literature was conducted on the following electronic databases: PubMed, Scopus, Trip Database, Science Direct, and Google Scholar. Then, guidelines, books, related organizations, and associations that provided methods for the adoption and adaptation of clinical guidelines were manually searched to identify

further published frameworks.

The search strategy designed was conducted with the combination of the Medical Subject Headings (MeSH) and free terms thesaurus by using the Boolean operators AND and OR. The MeSH terms used were the following: "clinical practice guideline", "Clinical Guideline", "guideline", "Adaptation", "Adoption", "Framework" and "Toolkit".

The inclusion criteria were as follows: Studies or toolkits that introduced the adaptation frameworks of clinical guidelines and the process or steps of adaptation of guidelines. Studies or toolkits that were published in English and from 1 January 2000 to 30 April 2021.

The exclusion criteria were as follows: Frameworks that did not describe the adaptation process and did not have a regular sequence and also frameworks that stated less than five steps for adaptation.

### Compare Frameworks

The comparison of the identified frameworks was performed in four stages. At the first stage (description), the evidence and information relevant to different frameworks and tools of adaptation of CPGs obtained from the study of various documents, books, reports, and articles were described. At the second stage (interpretation), the information described in the first stage was analyzed and interpreted. At the third stage (juxtaposition), the information obtained from the first and second stages was classified and put together so as to compare the dimensions and similarities and differences between the adaptation frameworks of clinical guidelines. Finally, at the fourth stage (comparison), different frameworks were compared in detail based on the information obtained from the previous stages. The comparison criteria were extracted based on the steps and features of each framework.

### Proposing a Framework

The initial framework was extracted after reviewing and comparing the frameworks. Then, two sessions were held with the panel of experts (three clinical specialists, two experts in the executive field of the health system, two methodologists with clinical guideline adaptation experience). In the first session, the initial framework was introduced, and members' opinions were recorded. In the second session, the framework was modified and the final framework was proposed.

## Results

### Literature Search and Selection

In the initial search, 26 frameworks were found, of which 18 were relevant to the objective of the study. A total of 11 adaptation frameworks met our inclusion criteria (Table 1).

Out of 11 selected frameworks, two frameworks have been excluded from the study:

1- The Systematic Guideline Review (SGR) framework (8) was based on the development of clinical guidelines.

2- The CAN-IMPLEMENT framework (18) integrated the Guideline Adaptation Framework with the Knowledge to Action (KTA) Framework.

Table 1. Characteristics of included adaptation frameworks

Framework	Developer	Year published	Country	Committee structure	Evaluate guidelines	Number of steps
PGEAC (19)	Graham, I. D. Harrison, M. B.	2005	Canada	A single local interdisciplinary 20 guideline evaluation group comprising key stakeholders	AGREE	10 main steps
AAP (20)	The Alberta Ambassador Program	2006	Canada	Three committees (guideline development group, advisory Committee, Steering Committee)	AGREE	3 main stages, 11 steps
Sequential process for the trans-contextual adaptation of guidelines (21)	Fervers, B. et al.	2006	France, Canada	Based on a review of the literature and experience of the authors	AGREE	7 steps
ADAPTE (11)	The ADAPTE Collaboration	2011	USA	Two committees (organizers and guideline developers)	AGREE	3 phase, 9 module, 24 steps
SNAP-IT by GRADE (MAGIC) (22)	McMaster GRADE group partnership with Norwegian Ministry of health	2014	Canada	Editorial committee, individual chapter editors	N/A	5 steps
Indian adaptation process (23)	Ministry of Health and Family Welfare in India	2017	India	Tulti-stakeholder guideline development group	AGREE	10 main steps
GRADE-ADOLPMENT (24)	McMaster GRADE group partnership with Saudi Arabian Ministry of health	2017	Saudi Arabian	McMaster group methodology task, final agreement of guideline topics, selection of panel members, logistics and communication is the responsibility of the Saudi Center for Evidence-Based Health Care (EBHC)	N/A	8 main steps
EFIM CPG-WG (25)	European Federation of Internal Medicine	2020	Belgium	EFIM Executive Committee	AGREE	3 phase, 17 steps
RCN (26)	The Royal College of Nursing	2000	UK	Most steps conducted by the 2 authors	N/A	5 steps
SGR (8)	German Society of General Practice and Family Medicine (DEGAM)	2006	Germany	Most steps conducted by the 5 authors	AGREE	9 steps
CAN-IMPLEMENT (18)	The Canadian Partnership Against Cancer	2013	Canada	Steering committee and working panel(s)	AGREE	3 phase, 4 focus

## Abbreviations:

PGEAC: Practice guideline evaluation and adaptation cycle;

AAP: Alberta Ambassador Program;

MAGIC: making grade the irresistible choice;

EFIM CPG-WG: European Federation of Internal Medicine Clinical Practice Guidelines-Working Group;

EFIM: European Federation of Internal Medicine;

GRADE: Grading of Recommendations Assessment, Development and Evaluation;

AGREE: Appraisal of Guidelines for Research and Evaluation;

RCN: The Royal College of Nursing;

SGR: Systematic Guideline Review;

EtD: Evidence to Decision;

N/A: Not Applicable.

### Compare Frameworks

The comparison of nine identified frameworks, in four stages. In the first and second stages, the description and interpretation of each of the frameworks were as follows:

#### PGEAC

Canadian researchers, namely Graham and Harrison, developed the practice Guidelines Evaluation and adaptation Cycle (PGEAC) in 2005 as a method for evaluating and adapting clinical guidelines for the adaptation of CPGs (19). PGEAC provides a framework for organizing and deciding whether to adopt high-quality guidelines (27). The PGEAC framework is designed to facilitate the comparison of different guidelines and recommendations on the same subject and provides a systematic way to evaluate the quality of guidelines and clinical tools (12).

#### Alberta Ambassador Program (AAP)

The AAP is a knowledge translation strategy developed in 2004-2006 in Alberta, Canada, in two phases. The first phase consisted of an experimental design based on the views of clinical experts. The second phase, which began in 2006, focused on adapting good quality guidelines according to local conditions for primary care to prevent, diagnose, or treat non-malignant and non-specific adult low back pain. The AAP adaptation framework consists of 11 steps in three main stages: 1) adjustment, 2) adaptation, and 3) finalization. The purpose of the adjustment phase is to assess knowledge among primary care staff and identify knowledge gaps, formulate research questions, and identify target audiences. The purpose of the second stage is to identify relevant guidelines, prepare an evidence table, hold a panel of experts and prepare a guideline. The purpose of the final stage includes reviewing and modifying, approving, and preparing a plan for publication and updating (20).

#### Sequential process for the trans-contextual adaptation of guidelines

During a review study in 2006, Fervers et al. adapted the clinical guideline adaptation methods and the experience of the research team and proposed a conceptual framework with a systematic approach to guideline adaptation. The method proposed in this study is a step-by-step approach to the adaptation of clinical guidelines that consider the organization of the health care system and the cultural context (21).

#### ADAPTE

The ADAPTE Collaborative Group held a series of workshops to define the ADAPTE process and to develop a guidebook and toolkit based on the early developments of the two adaptation processes and empirical studies in various fields between 2005 and 2007. The required information about the evaluation study was provided between July 2007 and September 2009, and registrants were required to sign a consent form. After uploading the ADAPTE handbook, registrants were asked to complete an assessment questionnaire. The frequency distribution of

responses was calculated. Then, open comments were analyzed for relevant topics (frequency, content). The ADAPTE framework generally consists of three phases (adjustment phase, adaptation phase, and finalization phase), 9 modules and 24 steps. In addition, each phase contains several modules and each module also, in turn, encompasses several steps accordingly (11, 28). The ADAPTE framework is designed to create the conditions necessary to ensure the quality and credibility of the obtained guidelines and to strengthen the commitment and ownership of professionals to the adapted guidance (29).

#### SNAP-IT by GRADE (MAGIC)

The Making Grade the Irresistible Choice (MAGIC) research program draws on a 5-step adaptation framework using the GRADE system and existing evidence and tools to localize clinical guidelines (e.g., ADAPTE) to improve the dissemination of reliable clinical guidelines. This framework was implemented in 2013 w to adapt the antithrombotic treatment guideline and implement a multi-layer presentation template (22).

#### Adaptation process for developing clinical guidelines in India

The Guidance Development Group (GDG) was a panel of leading and experienced Indian experts who were formed separately for each topic. The workshop on adaptation methods of CPGs for GDGs was jointly organized by the National Resources Center for Health Systems and the NICE Group (23).

#### GRADE-ADOLPMENT

The GRADE-ADOLPMENT framework was developed by a team of researchers from different countries (Canada, USA, Chile, Brazil, Mexico, Germany, France, Australia, Saudi Arabia, and Lebanon) to introduce a new national guidance program in Saudi Arabia in 2017. The methodologists team worked in the Department of Clinical Epidemiology and Vital Statistics at McMaster University, especially the GRADE McMaster Center. Project planning began in June 2012, and implementation of the guidelines began in July 2013. The first wave involved the production of Clinical Guidelines on ten different topics in 2013 and the second movement included the production of twelve Clinical Guidelines from 2014 to 2015 (24). To achieve the final framework, the research team has adopted a planned approach. They distinguished among the three important issues of adoption, adaptation, and new development by reviewing examples of final recommendations and using them as examples for the final framework (24). The GRADE-ADOLPMENT conceptual approach resulted in the adoption, adaptation and development of 226 recommendations in 22 guidelines.

#### EFIM CPG-WG

European Federation of Internal Medicine clinical practice guidelines Working Group (EFIM CPG-WG) started this project to answer the relevant clinical questions by selecting the best available guides, including constructive

and applicable recommendations. The research protocol which contained details of all the steps for writing a CPG was initially created. This adaptation framework is a tool that facilitates the use of valid clinical guidelines and implementation of recommendations through adapting general recommendations to specific clinical situations (elderly patients with comorbidities) that challenge European internists in their day-to-day practice (25).

### RCN

Based on the challenges of the guideline development of two tissue viability guidelines, i.e., the Management of Patients with Venous Leg Ulcers and Risk Assessment and Prevention of Pressure Ulcers, the Royal College of Nursing (RCN) devised an alternative strategy for adapting the guidelines to the local context. The localization framework introduced in 2000 by RCN is a five-step process. The adaptation process introduced in 2000 by RCN has five key steps (26).

After description and interpretation, in the third stage, the similarities and differences of the frameworks were identified. We have selected the 11 steps that have the most repetition in the frameworks. In the fourth stage, the adaptation steps of each of the identified frameworks were compared (Table 2).

### Proposed Framework

Table 2 shows that none of the identified frameworks described all the steps, and there are many differences in frameworks, such that some frameworks have more steps and some frameworks have fewer steps. Therefore, the research team designed the initial framework after performing four steps of comparative analysis. After holding two sessions with a panel of experts, a comprehensive framework was proposed (Fig. 1). The proposed comprehensive framework for the adaptation of clinical guidelines consists of ten main steps. This proposed framework describes the sub-steps or tools used in each step.

### Proposed steps for adaptation of clinical guidelines

#### Step 1: Establishment of an Interdisciplinary Guideline Group

Members of this group should represent all stakeholders whose activities potentially influence the adaptation of the guidelines. Multidisciplinary membership also increases the credibility and local ownership of guidelines and provides a tool to gain tacit knowledge from a wide range of health professionals in the evidence interpretation process, thus resulting in increasing the relevance of the final product.

#### Step 2: Selection of guideline topics

The second step is to select the title after identifying the need for instructions and creating a multidisciplinary working group. In this step, the knowledge gap is identified, the research question is formulated (define health questions (PICOT)), and the target audience is identified.

**P**= Population, Patient, or Problem

**I**= Intervention, Exposure or Prognostic Factor

**C**= Comparison, comparator, or control

**O**= Outcome you would like to measure or achieve

**T**= Type of question (Diagnosis, Etiology/Harm, Therapy, Prognosis, Prevention).

Reasons behind choosing a particular title can be the prevalence of the disease or the resulting burden, concerns about large changes in practice or care gap, the costs associated with different exercise options, the likelihood of guideline effectiveness, and awareness of relevant guidelines.

#### Step 3: Searching and screening guidelines

This step searches for related guidelines and evidence and describes resources, databases, and search strategies. The retrieved screening guidelines are screened according to the defined inclusion and exclusion criteria, and if necessary, their number is reduced.

#### Step 4: Assessment of guidelines

An important step in the adaptation process is the assessment of guidelines. Most of the frameworks identified in the guidelines assessment take into account relatively similar dimensions, for example, assessing the overall quality of the guidelines, methodological strategy for the development of guidelines, evaluating the content of the recommendations, and applying the recommendations. The AGREE instrument is a widely used standard for assessing the methodological quality of practice guidelines (30). However, it is possible that high-quality guidelines may include several incomplete recommendations. To ensure more quality assessment, other factors should be considered: methods used to search and select evidence, databases, search strategies, and inclusion and exclusion criteria. The Persian version of AGREE instrument was validated by Rashidian et al. (31, 32).

#### Step 5: Decision and Selection

At this stage, the assessments are considered over and over again to make sure if the search process is repeated. Based on the collected evidence and recommendations, the most appropriate ones for adaptation should be selected based on the priorities. Of course, there is no universally and unanimously accepted unit system for grading evidence levels or types of recommendations (9, 33, 34). As a result, the grading of evidence or types of recommendations based on strength and quality varies considerably across types of guidelines. Therefore, the priorities and grading of evidence or types of recommendations are finally determined by the guideline group.

#### Step 6: Adoption or Adaption

“Adoption of guidelines implies an existing and trustworthy recommendation without modification of the original recommendation and providing information on its implementation. The adapted recommendation may have a change in the specific population, intervention, comparator than the original recommendation and a different certainty in the evidence” (24). If the chosen topic is not covered by the published international evidence and guidelines, new recommendations can be developed according to the underlying questions.

Table 2. Adaptation steps of each of the identified frameworks

Framework	Step in the adaptation process											Additional steps
	Establish an Interdisciplinary Guideline Group	Select of guideline topics	Search and screen guidelines	Assess Guidelines	Decision and Selection	Adopt or Adapt	Develop new recommendations	External Review	Finalize Local Guideline	Dissemination and implementation	Updating	
PGEAC (19)	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes	No	Yes	- Establish Guideline Appraisal Process - Obtain official endorsement and adoption of local guideline
AAP (20)	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	- Knowledge assessment survey - Knowledge gap identified; research question formulated; target audience delineated - Evidence inventory tables with seed CPG recommendations developed - Guideline endorsed
Sequential process for the trans-contextual adaptation of guidelines (21)	No	Yes	Yes	Yes	No	Yes	No	Yes	No	Yes	No	- Assess clinical content of the source guidelines - Endorsement of the adapted guideline
ADAPTE (11)	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	Yes	- Identify necessary resources and skills - Check whether adaptation is feasible - Write adaptation plan - Complete tasks for the set-up phase - Determine the health clinical/policy questions - Customization
SNAP-IT by GRADE (MAGIC) (22)	Yes	Yes	No	No	No	No	No	Yes	Yes	Yes	Yes	- Acknowledge source documents - Convene start-up conference - Conflicts of interest - Updated Search for new documentation - Evaluation for the overall adaptation process

Table 2. Adaptation steps of each of the identified frameworks

Framework	Step in the adaptation process											Additional steps
	Establish an Interdisciplinary Guideline Group	Select of guideline topics	Search and screen guidelines	Assess Guidelines	Decision and Selection	Adopt or Adapt	Develop new recommendations	External Review	Finalize Local Guideline	Dissemination and implementation	Updating	
Indian adaptation process (23)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	-Compile adopted, and new recommendations adapted, harmonization (quality control)
GRADE-ADOLOPMENT (24)	No	Yes	Yes	No	Yes	Yes	Yes	No	No	No	No	-Prioritization of question -Matching recommendation -Update systematic reviews as needed - ETD from source guideline
EFIM CPG-WG (25)	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No	Yes	No	-Select external experts -Declare a potential conflict of interest -Define health questions (PICOs) -Combine PICOs lists together -Accept the final list of PICOs -Assess the applicability of recommendation to internal medicine practice -Draft the report -Review the draft, prepare the report for publication
RCN (26)	No	Yes	Yes	Yes	No	No	No	No	Yes	No	No	-Appraising the applicability of the clinical guideline

## Abbreviations:

PGEAC: Practice guideline evaluation and adaptation cycle;

AAP: Alberta Ambassador Program;

MAGIC: making grade the irresistible choice;

EFIM CPG-WG: European Federation of Internal Medicine Clinical Practice Guidelines-Working Group;

EtD: Evidence to Decision;

RCN; Royal College of Nursing.

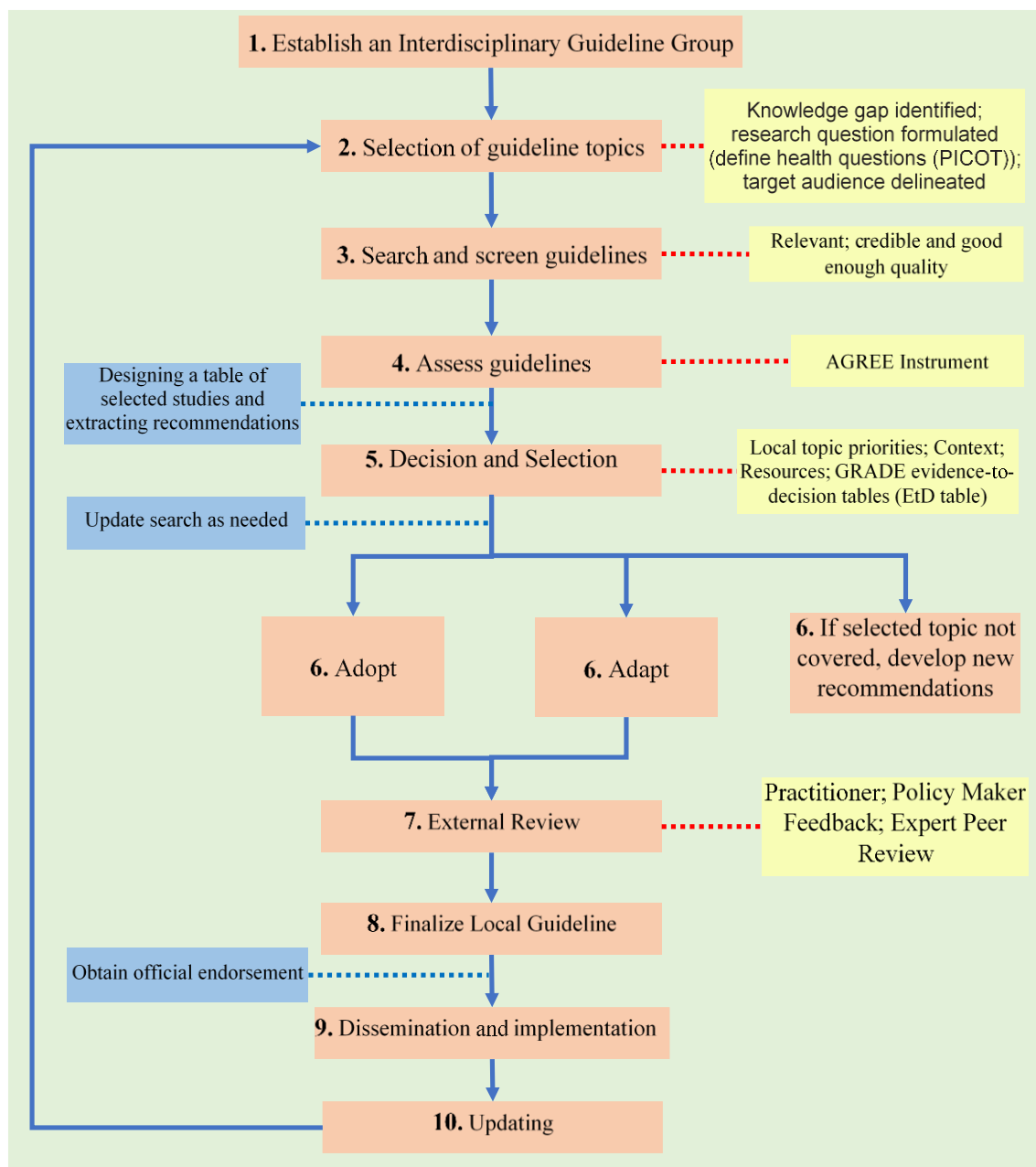


Fig. 1. Proposed Comprehensive framework for adaptation of clinical guidelines

### Step 7: External Review

The draft guideline should be submitted to clinical experts, methodologists, organizational policymakers, and other stakeholders for possible review and comment. Therefore, the guideline needs to be externally reviewed before finalization. The comments and suggestions of the review group should be applied, either by modifying the guideline or by giving reasons why they were discarded.

### Step 8: Finalization of the Local Guideline

The guideline is finalized by the Multidisciplinary Working Group prior to publication and implementation. It is, thus, important to hold a consultation and leadership meeting with representatives of various scientific associations to gain support in approving, promoting, and publishing the guidelines. Creating such partnerships, of

course, increases the credibility of adapted guidelines among physicians.

### Step 9: Dissemination and implementation

Key strategies for managing the dissemination and implementation of guidelines include targeting dissemination to the public and insurers, engaging key stakeholders, facilitating access to adapted guidelines over the Internet, and promoting adapted guidelines among healthcare professionals (20).

### Step 10: Updating

Since the guidelines usually become obsolete within 4 years from the date of publication, they need to be constantly updated (9, 34). Therefore, a good guideline is updated every two years (20).

## Discussion

Adaptations at the national level lead to ongoing improvement in healthcare service delivery and outcomes (35). They also provide essential feedback to improving and updating global guidance (36). Adaptation of clinical guidelines to local context is critical to effective knowledge translation and requires an understanding of the local context and the implications of the best practice within that context so that recommendations can be adapted in ways that best fit the culture (37). There are many acceptable frameworks and principles for developing high-quality clinical guidelines (2, 38, 39), but there is no internationally accepted framework for adapting them to local contexts (21, 23). Therefore, the aim of this study was to describe, interpret and compare different frameworks for adaptation of clinical guidelines and to propose a comprehensive framework for Iran.

Among the studies in the field of reviewing the frameworks of adaptation of clinical guidelines, one can, for example, refer to the Wang et al. (40) study which discussed the advantages and limitations of adaptation frameworks of clinical guidelines in 2018. Also, Darzi et al. (41) study identified and described eight adaptation frameworks for clinical guidelines in 2017. In addition, Fervers et al. (21) reviewed the literature on adaptation frameworks and proposed an 8-step framework in 2006.

In order to achieve clinical effectiveness, the best practice which requires a set of macro and micro strategies enabling facilitation, promotion, or guaranteeing clinical knowledge application should be realized in the country (42). Adaptation of clinical guidelines is a structural investment that is feasible at the national level. Of course, informational, technological, economic, social, and professional variables influence the effectiveness of adaptation of clinical guidelines (43). In resource-constrained countries, however, adaptation of clinical guidelines is potentially more effective than the development of clinical guidelines (21). The adaptation of CPGs creates local innovation and indirectly provides an environment in which "change" is more acceptable (6).

A comprehensive approach to adaptation based on a framework is valuable (40). This approach reduces unforeseen challenges in guideline adaptation (20). Using frameworks in the process of adaptation can be optimized by increasing the understanding and estimation of the resources and time required, capacity building in adaptation methods, and increasing the adaptability of the source recommendation document (40).

The limitations of the present study were as follows: Only studies or tools published in English were included and the lack of indexing of some clinical guidelines adaptation frameworks in databases. However, the research team of this study assumes that all frameworks have been identified.

## Conclusion

In recent years, different clinical guidelines adaptation frameworks have been published in the world, these frameworks have similarities and differences. It is difficult

to choose a framework that is acceptable to all groups, associations and organizations. We reviewed, described, interpreted and compared different frameworks for adaptation of clinical guidelines. The proposed comprehensive framework is an appropriate tool for adaptation of clinical guidelines in Iran that can be used in other countries. Having an acceptable framework for all local groups helps with high quality adaptation guidelines and becomes adaptation simpler and quicker. Our framework can serve as a starting point for adaptation of clinical guidelines. However, further validation of the framework requires case studies and expert consultation to determine its application to adaptation of clinical guidelines.

## Acknowledgment

The researchers express their sincere appreciation and gratitude to all participants who participated in this study.

## Ethical Approval

The study was approved by the local ethical committee (code: IR.TUMS.SPH.REC.1399.009) and the Helsinki Declaration was respected across the study.

## Conflict of Interests

The authors declare that they have no competing interests.

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