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ORIGINAL ARTICLE

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Reporting quality of 2014–2018 clinical practice guidelines on diabetes according to the RIGHT checklist

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Abstract

Objective Reporting Items for Clinical Practice Guidelines (CPGs) in HealThcare (RIGHT) checklist was used as a tool to assess the reporting quality of 2014–2018 CPGs on diabetes treatment, aiming to promote the application of RIGHT and improve the reporting quality of future guidelines.

Methods We searched Chinese Biomedical Literature Service System (CBM), China National Knowledge Infrastructure (CNKI), Wanfang Data, VIP database, Medline, Embase, Allied, and Complementary MEdicine Database (AMED), and Medlive and Google Scholar (Google academics), and collected published CPGs on diabetes with published date during 1st January, 2014 and 7th November, 2018. CPGs on diabetes issued since 2014 were included and filtered by two reviewers independently. Then the basic information extraction and RIGHT evaluation of the included CPG are carried out.

Results A total of 34 guidelines were included, out of which 7 are for Chinese and 27 for other countries. Overall, basic information (domain 1) got the highest (64.66%) reporting rate, while financing and conflict-of-interest statements and management (domain 6) got the lowest (8.1%). For all guidelines, classification of guidelines (item 1c) was sufficiently reported, and description of the specific sources of funding for all stages of guideline development (item 18a) was not reported. For Chinese CPGs, financing and conflict-of-interest statements and management (domain 6) was most insufficiently reported, and only identification of guideline in the title (item 1a), corresponding information of the developer or author (item 4), description of basic epidemiology (item 5), and subgroup description (item 7b) out of 22 items were better reported than foreign guidelines.

Conclusions Overall, the CPGs on diabetes during 2014–2018 adhered to ~41% RIGHT checklist, of which Chinese CPGs adhered less than that of foreign guidelines. It is suggested that the RIGHT reporting checklist should be endorsed and used by CPG developers to ensure higher quality and adequate use of guidelines.

Keywords RIGHT · clinical practice guidelines · reporting quality · diabetes

Abbreviations

RIGHT	Reporting Items for practice Guidelines in HealThcare
EQUATOR	Enhancing the Quality and Transparency of Health Research
AGREE	Appraisal of Guidelines for REsearch and Evaluation
CPGs	Clinical Practice Guidelines
PICO	Patient, Intervention, Comparison, Outcome
WHO	World Health Organization
HPGs	Health Practice Guidelines

Introduction

Clinical Practice Guidelines (CPGs) is a statement of systematic development to help practitioners and patients to determine the appropriate health-care plan for specific clinical circumstances [1]. Guideline herein is a guidance document designed to help health-care practitioners and patients make appropriate decisions after systematic

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research on specific clinical issues [2]. Currently, most of the researchers for CPGs focus on the quality of the guidelines. To standardize the reporting of the guidelines is an urgent problem in the domain of evidence-based medicine [3]. In 2013, Yaolong Chen et al. initiated and developed the RIGHT checklist, a reporting tool for practice guidelines in health care, consisting of 7 domains and 22 items. The RIGHT checklist assists developers in reporting guidelines, supports journal editors, and peer reviewers when considering guideline reports, and helps health-care practitioners understand and implement a guideline. It provides users and evaluators a clear, explicit description of the processes and procedures used to develop a guideline and access to the evidence used to formulate each recommendation [4]. The checklist was subsequently included on the EQUATOR website and became a powerful tool for guideline evaluation different from AGREE (Appraisal of Guidelines for REsearch and Evaluation), a tool to assess the methodological rigor and transparency in which a practice guideline is developed and can be used to guide their development.

With the global morbidity and disability rate of diabetes increasing in recent years, more countries have concerned about the prevention and treatment of diabetes, bringing a diversity of treating methods and drugs. The number of consultation and screening guidelines for diabetes developed by associations and ministries of health from different countries has increased. The content of these guidelines tends to be matured and refined, such as guidelines for the use of insulin for the treatment of type 2 diabetes and guidelines for the use of insulin pumps. However, there is still a lack of relevant research in the world on the reporting standards and quality evaluation of diabetes treatment guidelines. Therefore, we used the RIGHT standard to evaluate the reporting quality of guidelines on diabetes that were published in the last 5 years and compared the reporting outcomes of Chinese and foreign guidelines. Our research results can provide more transparent and scientific synthetic evidence for clinical practitioners and researchers, thus making some guidance for their clinical practice and scientific research work. By offering updating advice for CPG developers, our research aims to promote the use of RIGHT worldwide and improve the quality of future guidelines, as well as to provide better guidance for clinical treatment of diabetes.

Methods

Search strategy

We searched Chinese Biomedical Literature Service System (CBM), China National Knowledge Infrastructure (CNKI), Wanfang Data, VIP database, Medline, Embase, Allied, and Complementary Medicine Database (AMED), and Medlive and Google Scholar (Google academics), and supplemented the search for Best Practice, UpToDate, DynaMed, Clinical Evidence, and Essential Evidence Plus databases to collect CPGs on diabetes published in China and abroad, with the publication date limited between 1st January, 2014 and 7th November, 2018. We used "Guideline" as the subject word and set the search formula as ("Guideline" OR "Recommendation" OR "Consensus") AND ("Diabetes" OR "Prediabetes" OR "Abnormal glucose tolerance" OR "Impaired fasting blood glucose"), adjusting the search formula according to different database characteristics. More detail of the search strategy can be seen in Tables 3a and 3b.

In order to assess the reporting quality of guidelines on diabetes for the last 5 years, guidelines published during the period from 1st January, 2014 to 7th November, 2018 and consisted of the definitions herein were included. The target population were adults (age > 18-year old) diagnosed as diabetes, prediabetes, impaired glucose tolerance, and impaired fasting glucose. Literatures of guideline abstract, bibliographic guideline or conference record, translated or adapted versions of foreign guidelines, non-CPGs, nontherapeutic guidelines, treatment of diabetic complications, or treatment for other diseases were excluded. For republished guidelines, only the first published one was included. For regularly updated guidelines, only the latest updated one was included.

Two reviewers conducted independent screening and cross-checking based on title, abstract, and full text, and resolved through negotiation when differences occurred. The literature screening process is shown in Fig. 1.

Reporting quality assessment

On the basis of the original 22 items of the RIGHT checklist, with the permission of the RIGHT working group, we subdivided certain items into two to three subitems according to their content, forming a data collection table of 37 items, as is shown in Table 1. Data extraction personnel were trained, and two rounds of pre-evaluation were completed before formal guideline evaluation. Kappa coefficient for individual 37 items of the RIGHT checklist ranged from 0.63 to 1.0, used to measure evaluation consistency [5]. Two researchers independently extracted data and cross-checked, and resolved through negotiation when differences occurred. The extracted information included general characteristics of the guideline (such as title, published journal, publication year and country, funding, organization, update information, etc.) and the reporting content of the guideline. The evaluation covered 37 items in seven domains, containing basic information, background, evidence, recommendations, review and quality assurance, funding and conflict-of-interest statements and management, and other information of the guideline [5]. We

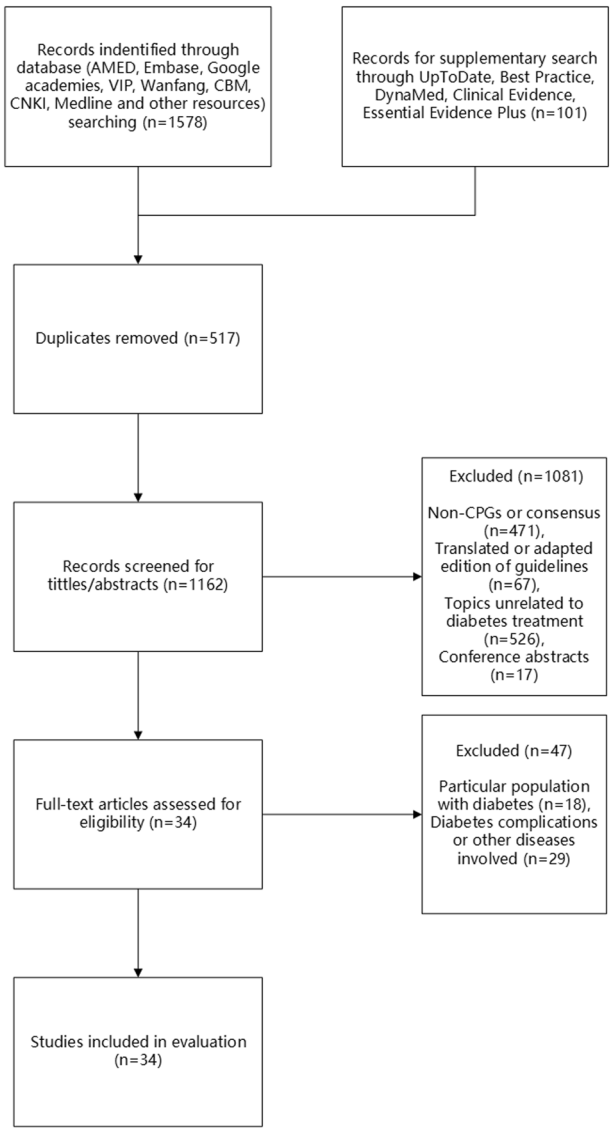

Fig. 1 Literature screening flowchart

rated items with dichotomous options, "reported", "partially reported", "unreported", and "not applicable". "Reported": relevant information is fully presented; "Unreported": applicable to situations where there is no complete lack of relevant information; "Partially reported": only part of the content is presented; "Not applicable": the guideline does not meet the evaluation requirements of an item and cannot be evaluated by "Reported", "Partially reported", or "Unreported" [6]. The adherence of 34 CPGs to RIGHT checklist items was calculated to evaluate the overall reporting quality.

Statistical analysis

The Office Excel 2016 software was used to summarize the reporting rates and percentages of the RIGHT items and domains for the guidelines.

Results

Basic characteristics of included studies

A total of 1598 literatures were retrieved, and after screening and supplementary searching, 34 literatures were finally included [7–39]. The specific inclusion criteria and exclusion criteria of the literatures are shown in Tables 3a and 3b. Table 2 summarizes the characteristics of the included CPGs.

Overall reporting quality of guidelines on diabetes

Overall, the 34 CPGs adhered to ~41% of RIGHT checklist items. The foreign CPGs adhered to 45.0% RIGHT checklist items, while Chinese CPGs adhered to 25.5%. As Fig. 2 indicates,[1], of the 34 guidelines, the reporting rates were <65% in all domains, with the highest in domain 1-basic information, while domain 6-funding and declarations and management of interest got the lowest.

As for specific items, the reporting rate of items related to the key elements of the guidelines was higher than the other section, for example, items 1a, 1c, 7a, and 13a. However, the reporting rates of the quality control description, details of the development process, sources of funding, and the role of funders in the dissemination of the guideline were low, as reported in items 17, 18a, 18b, and 22. In addition, it is important to note that some of the guidelines were partially reported on items 3, 4, 6, 9a-2, 9b, 10b, 13c, 14a, 14b, 18a, 19b, and 22, thus affecting their overall reporting quality.

In seven domains of the RIGHT checklist, the biggest difference of adherence between foreign and Chinese CPGs was 33.5% on other information (access, suggestions for further research, and limitations of the guideline), followed by background (23.25% difference) and recommendations (22.3% difference). The smallest difference of adherence between the two was basic information (6.5% difference) (Fig. 3).

Reporting according to each domain of the RIGHT checklist

Basic information

A total of 19 guidelines summarized the recommendations, but only ten summarized in an executive summary. Only four (11.8%) of the guidelines reported both a glossary and a list of acronyms or abbreviations, with 50% of the guidelines partially reported and 38.2% unreported. Eight

[1] In Figs. 2 and 3: Domain 1: Basic information, Domain 2: Background, Domain 3: Evidence, Domain 4: Recommendations, Domain 5: Review and quality assurance, Domain 6: Funding and declaration and management of interests, Domain 7: Other information.

Table 1 Reporting rate of 37-item RIGHT for CPGs on diabetes 2014–2018 ($n = 34$)

Domain/number	Item	Reported	Partially reported	Unreported	Not applicable
1 Basic information					
1a	Identify the report as a guideline, that is, with "guideline(s)" or "recommendation(s)" in the title	33 (97.1)	0	1 (2.9)	0
1b	Describe the year of publication of the guideline	31 (91.2)	0	3 (8.8)	0
1c	Describe the focus of the guideline, such as screening, diagnosis, treatment, management, prevention, or others	34 (100)	0	0	0
2	Provide a summary of the recommendations contained in the guideline	19 (55.9)	0	15 (44.1)	0
3	Define new or key terms, and provide a list of abbreviations and acronyms if applicable	4 (11.8)	17 (50)	13 (38.2)	0
4	Identify at least one corresponding developer or author who can be contacted about the guideline	11 (32.4)	8 (23.5)	15 (44.1)	0
2 Background					
5	Describe the basic epidemiology of the problem, such as the relevance/incidence, morbidity, mortality, and burden (including financial) resulting from the problem	24 (70.6)	0	10 (29.4)	0
6	Describe the aim(s) of the guideline and specific objectives, such as improvements in health indicators (e.g., mortality and disease prevalence), quality of life, or cost savings	5 (14.7)	22 (64.7)	7 (20.6)	0
7a	Describe the primary population(s) that is affected by the recommendation(s) in the guideline	33 (97.1)	0	1 (2.9)	0
7b	Describe any subgroups that are given special consideration in the guideline	26 (76.5)	0	8 (23.5)	0
8a	Describe the intended primary users of the guideline (such as primary care providers, clinical specialists, public health practitioners, program managers, and policymakers) and other potential users of the guideline	22 (64.7)	0	12 (35.3)	0
8b	Describe the setting(s) for which the guideline is intended, such as primary care, low- and middle-income countries, or inpatient facilities	12 (35.3)	0	22 (64.7)	0
9a-1	Describe how all contributors to the guideline development were selected	6 (17.6)	0	28 (82.4)	0
9a-2	Describe the roles and responsibilities of all contributors (e.g., steering group, guideline panel, external reviewers, systematic review team, and methodologists)	7 (20.6)	17 (50)	10 (29.4)	0
9b	List all individuals involved in developing the guideline, including their title, role(s), and institutional affiliation(s)	9 (26.5)	14 (41.2)	11 (32.4)	0
3 Evidence					
10a	State the key questions that were the basis for the recommendations in PICO (population, intervention, comparator, and outcome) or other format as appropriate	12 (35.3)	0	22 (64.7)	0
10b	Indicate how the outcomes were selected and sorted	4 (11.8)	2 (5.9)	28 (82.4)	0
11a	Indicate whether the guideline is based on new systematic reviews done specifically for this guideline or whether existing systematic reviews were used	8 (23.5)	0	26 (76.5)	0
11b-1	If the guideline developers used existing systematic reviews, reference these and describe how those reviews were identified and assessed (provide the search strategies and the selection criteria, and describe how the risk of bias was evaluated)	9 (26.5)	0	25 (73.5)	0
11b-2	State whether the systematic reviews used were updated	2 (5.9)	0	6 (17.6)	26 (76.5)
12	Describe the approach used to assess the certainty of the body of evidence	25 (73.5)	0	9 (26.5)	0
4 Recommendations					
13a	Provide clear, precise, and actionable recommendations	33 (97.1)	0	1 (2.9)	0
13b	Present separate recommendations for important subgroups if the evidence suggests that there are important differences in factors influencing recommendations, particularly the balance of benefits and harms across subgroups	23 (67.6)	0	2 (5.9)	9 (26.5)

Table 1 (continued)

Domain/number	Item	Reported	Partially reported	Unreported	Not applicable
13c	Indicate the strength of recommendations and the certainty of the supporting evidence	17 (50)	7 (20.6)	2 (5.9)	8 (23.5)
14a	Describe whether values and preferences of the target population(s) were considered in the formulation of each recommendation. If yes, describe the approaches and methods used to elicit or identify these values and preferences. If values and preferences were not considered, provide an explanation	8 (23.5)	14 (41.2)	12 (35.3)	0
14b	Describe whether cost and resource implications were considered in the formulation of recommendations. If yes, describe the specific approaches and methods used (such as cost-effectiveness analysis) and summarize the results. If resource issues were not considered, provide an explanation	6 (17.6)	18 (52.9)	10 (29.4)	0
14c	Describe other factors taken into consideration when formulating the recommendations, such as equity, feasibility, and acceptability	19 (55.9)	0	15 (44.1)	0
15	Describe the processes and approaches used by the guideline development group to make decisions, particularly the formulation of recommendations (such as how consensus was defined and achieved and whether voting was used)	12 (35.3)	0	22 (64.7)	0
5 Review and quality assurance					
16	Indicate whether the draft guideline underwent independent review, and if so, how this was executed and the comments considered and addressed	18 (52.9)	0	16 (47.1)	0
17	Indicate whether the guideline was subjected to a quality assurance process. If yes, describe the process	1 (2.9)	0	33 (97.1)	0
6 Funding, declaration, and management of interests					
18a	Describe the specific sources of funding for all stages of guideline development	0	12 (35.3)	22 (64.7)	0
18b	Describe the role of funder(s) in the different stages of guideline development and in the dissemination and implementation of the recommendations	1 (2.9)	0	6 (17.6)	27 (79.4)
19a	Describe what types of conflicts (financial and nonfinancial) were relevant to guideline development	3 (8.8)	0	26 (76.5)	5 (14.7)
19b	Describe how conflicts of interest were evaluated and managed, and how users of the guideline can access the declarations	7 (20.6)	7 (20.6)	9 (26.5)	11 (32.4)
7 Other information					
20	Describe where the guideline, its appendices, and other related documents can be accessed	21 (61.8)	0	13 (38.2)	0
21	Describe the gaps in the evidence and/or provide suggestions for future research	10 (29.4)	0	24 (70.6)	0
22	Describe any limitations in the guideline development process (such as the development groups were not multidisciplinary or patients' values and preferences were not sought), and indicate how these limitations might have affected the validity of the recommendations	1 (2.9)	2 (5.9)	31 (91.2)	0

Table 2 Characteristics of CPGs on diabetes ($n = 34$)

Characteristics		Number (%)
Publication year	2014	5 (14.7)
	2015	6 (17.6)
	2016	4 (11.8)
	2017	10 (29.4)
	2018	9 (26.5)
Topic	Treatment	9 (26.5)
	Management or clinical application	8 (23.5)
	Comprehensive treatment plan	7 (20.6)
	Diagnosis and treatment	3 (8.8)
	Prevention and treatment	4 (11.8)
	Nutrition and diet	3 (8.8)
Country	the United States	8 (23.5)
	China	7 (20.6)
	the United Kingdom	3 (8.8)
	India	3 (8.8)
	International organizations	2 (5.9)
	Singapore	1 (2.9)
	Japan	1 (2.9)
	Korea	1 (2.9)
	Indonesia	1 (2.9)
	Malaysia	1 (2.9)
	Australia	1 (2.9)
	Spain	1 (2.9)
	Scotland	1 (2.9)
	Poland	1 (2.9)
	Canada	1 (2.9)
	Colombia	1 (2.9)
Developers	1 Association	20 (58.8)
	≥2 Institutions	4 (11.8)
	Working groups	4 (11.8)
	Individuals	2 (5.9)
	Committees	1 (2.9)
	National Health Ministries or Universities	2 (5.9)
	Unreported	1 (2.9)

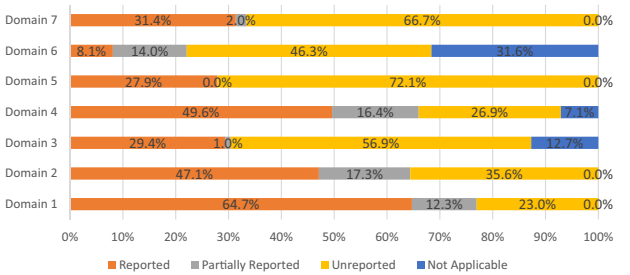

Fig. 2 RIGHT reporting rate in seven domains of diabetes guidelines 2014–2018. Note: Domain 1: Basic information, Domain 2: Background, Domain 3: Evidence, Domain 4: Recommendations, Domain 5: Review and quality assurance, Domain 6: Funding and declaration and management of interests, Domain 7: Other information

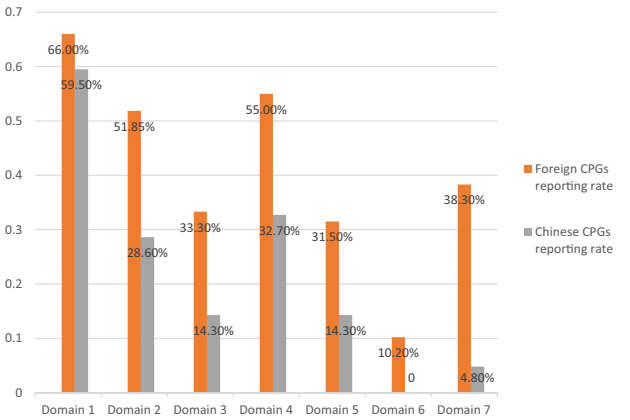

Fig. 3 Comparison of adherence of RIGHT domains of Chinese and foreign CPGs 2014–2018. Note: Domain 1: Basic information, Domain 2: Background, Domain 3: Evidence, Domain 4: Recommendations, Domain 5: Review and quality assurance, Domain 6: Funding and declaration and management of interests, Domain 7: Other information

(23.5%) guidelines reported only the official contact information of the institute, magazine, or publisher. A total of 15 (44.1%) guidelines did not provide information on any of the above modes of communication. At this item, the reporting rate of the Chinese CPGs was higher than foreign CPGs.

Background

Of all included CPGs, 5 (14.7%) guidelines sufficiently reported the aims and specific objectives of the guidelines (item 6), and 21 (61.8%) reported the aim of the guideline only, while 1 reported only specific objectives. A total of 22 CPGs (64.7%) did not describe the specific targeted environment of the guideline. Less than 30% CPGs reported on the selection, roles, and personal information of contributors to the guidelines.

Evidence

Twelve (35.3%) included CPGs reported on the key question on which the guideline was based. Only four (11.8%) guidelines completely reported on how the outcomes were selected and sorted. The adherence of the use of systematic reviews and selection basis (items 11a, 11b-1, and 11b-2) was <30%, lacking of sufficient description and clear detail. A total of 35.3% CPGs ($n = 12$) described the processes and approaches used by the guideline development group to make decisions.

Recommendations

There were partial reports on whether the CPG developers considered the values and preferences of the target population (item 14a) and costs and resources implications (item 14b), which were 41.2% and 52.9%, respectively. Besides, only one of the included Chinese CPGs reported that preferences and values of the target population were considered.

Review and quality assurance

A total of 18 CPGs reported on whether the draft guideline underwent an independent review: 11 (32.4%) guidelines reported the peer reviewers, 1 described the review process, and 5 (14.7%) reported both, while 1 only mentioned that the guideline had undergone a review. Only one CPG made by WHO (World Health Organization) reported that the guideline had undergone a quality assurance process.

Funding and declaration and management of interests

Description of the specific sources of funding for all stages of guideline development was not sufficiently reported by all CPGs. Only one guideline reported the role of funders in different stages of guideline development and in the dissemination and implementation of the recommendations. The reporting rate of types of conflicts was 8.8% ($n = 3$), but there were five CPGs either reported on without conflicts of interest or did not mention about that.

Other information

Less than 30% of the guidelines reported on either the gaps in the evidence or providing suggestions for future research. Only one CPG fully reported on limitations in the guideline development process.

Discussion

Implication of the study

This is the first comprehensive evaluation of diabetes guidelines for 2014–2018. We used the RIGHT checklist to assess 34 included diabetes guidelines and compared the adherence to RIGHT checklist between Chinese and foreign CPGs. On the premise of the 37-item RIGHT checklist, a total of 516 items (41%) were reported by 34 guidelines, with an average of 15.2 items per guideline. Among them, foreign guidelines and the Chinese guidelines reported 16.7 items (45%) and 9.4 items (25.5%), respectively.

The overall reporting quality of 2014–2018 diabetes CPGs is more consistent with that of the 2014–2016 Croatian and European HPGs (Health Practice Guidelines) [5]: the former adhered to <50% of the RIGHT checklist, while the latter complied with 41% of the RIGHT checklist. The adherence of the foreign CPGs was closer to that of the Croatian and European HPGs, while the quality of the Chinese guidelines was poor, adhering to <30% RIGHT checklist.

Analysis of the reporting quality of guidelines on diabetes

Basic information

First, there was a partial reporting rate of 50% on providing a glossary and a list of acronyms or abbreviations. In order to facilitate the application and implementation of the guidelines and to avoid confusion of its content, it is recommended that guideline developers refer to the guidelines developed by the World Health Organization (WHO) for an independent, clear and accurate summary of the acronym, and glossary at the beginning or the end of the guidelines. Professor Yaolong Chen [6] suggested that guideline developers should use terms and acronyms that have been standardized at home and abroad.

Second, <35% of the CPGs adequately reported the corresponding information. This was not convenient for guideline developers to receive feedback from users in a timely manner, as well as further revision, improvement, and updating of the content of the guidelines.

Background

More than 60% of the CPGs included lacked a description of the specific goals, as well as the target health settings. Over 35% of CPGs did not report users of the guidelines. The general aim and the specific goals reflect the expected benefits that it can achieve for the clinic, the patients, and the society. A clear description of users and specific health environments in the guidelines can help reduce the waste of some medical resources. Without clarifying how to use the guideline and target users is contrary to the purpose for the development of the guideline. Thus, it is advised that the guideline developers should perfect this content in the formulation and updating of guidelines.

Evidence

First, nearly 65% of the CPGs did not report the key question that the guideline based on. This question is significant in the guideline, being the basis of systematic literature retrieval, determines the scope of the whole

guideline and the content of the recommendations. It is advised that it should be clearly presented in the form of PICO (Patient, Intervention, Comparison, and Outcome).

Second, the process of evidence preparation was inadequately reported. Methodological details such as if how the systematic reviews were selected and whether updated and how the evidence finally sorted were not taken seriously in the preparation of over 60% of included guidelines. What is important, RIGHT, as a guideline evaluation tool, is not used to assess the quality of the guideline methodology, but to assess the clarity of the guidelines.

Recommendations

First, only 50% of the CPGs included in this study fully reported on both strength of recommendations and certainty of supporting evidence. The Chinese guidelines poorly reported in this item, only 14.3% ($n = 1$) reported two components. Less than 50% of the CPGs included used matured grading systems, such as GRADE. This means that the needs of guideline users cannot be met. Moreover, details on the selection and evaluation of evidence of over 60% CPGs were unsatisfactory.

Second, in Chinese CPGs, reporting on the inclusion of patient values and preferences in the making of recommendations was poor, and reporting cost and resource considerations was nonexistent. This reflects the unsatisfactory level of patient participation in the development of the guidelines. The neglect of economic factors and resource constraints, to some extent, reduces the feasibility of the recommendations of the guidelines. It should be noted that the RIGHT checklist does not assess the effectiveness of the recommendations in the guidelines.

Funding and declaration and management of interests

We also found that there was no report on conflicts of interest and funding in the included Chinese guidelines and that the reporting rate in this domain of the foreign guidelines was only 10.2%. Both groups of guidelines showed a low adherence of diabetes guidelines over the past 5 years to providing declarations on the conflicts of interest and funding as well as elaborating policies regarding their management. Christopher AKY [40] suggested that detailed conflicts of interest management methods should be clearly defined in the development of the guideline, as well as a clear report on any conflict of interests that might exist in the final release of the guideline. Financial support and conflicts of interest may affect the outcome of recommendations. In order to improve the credibility and application of the recommendations of the guidelines, both should be reported clearly and transparently.

Other information

The lack of a sufficient description of the limitations of the guideline development and recommendations for future research could not provide a guidance for future updates of the guideline and other researchers for further research. It also to some extent reflects a deficiency of rigor of the working group in the development of the guideline. Refining relevant content will contribute to improving the credibility and quality of the guideline, as well as providing some references for guideline users whether to adopt recommendations.

Advantages and limitations of the study

In this study, the quality of CPGs on diabetes published at home and abroad in 2014 and 2018 was evaluated by using the scientific international guidelines reporting the standard evaluation tool—RIGHT. The included guidelines were independently screened and cross-checked by two researchers on the basis of topics, abstracts, and full texts, which helped to reduce selection bias. Before the data extraction, two reviewers were trained, two rounds of pre-evaluation were completed, and the Kappa score was used to measure the consistency of the evaluation. Then the two researchers independently extracted the data and cross-check. These procedures were conducive to reduce interference and misjudgment, avoid expectation bias, and improve the validity and reliability of this review. This review also had some limitations as follows: (1) the guidelines included in this study were mainly medical treatment, nutrition, and diet guidelines, exercise guidelines were excluded for it was not primary therapies. So when extrapolating results and conclusions we should be careful. (2) The statistical results were based on the data reported by the guideline. We did not contact the CPGs corresponding authors for the underreported data for further acquisition and analysis, which may cause a certain degree of bias to the results. (3) The sample size of this study is small, and the gap between the sample size of Chinese and foreign guidelines is large, so we did not carry out further analysis and statistics of the two groups of reporting rates of each item. (4) We only searched a total of 14 databases mentioned in the article, which did not cover all channels for the publication of the guidelines. (5) It is not excluded that different kind of units by which the guidelines were developed may have an impact on the reporting quality of guidelines, and further study is required.

Conclusions

The 34 CPGs on diabetes adhered to ~41% RIGHT checklist items. Adherence of foreign CPGs was evidently

higher than Chinese. Chinese guidelines were generally not long, even if instructions for preparation were provided, they did not significantly increase the content of reporting that met the requirements of the RIGHT checklist. However, poor reporting quality of CPGs should mainly blame on the lack of normative awareness in the development of the guideline and resource constraints or inadequate detailed descriptions, which could be seen from this review. A guideline with poor reporting quality cannot play its due role in clinical guidance, but may mislead users, leading to procedural diagnosis and treatment, resulting in waste of medical resources and delay of the patients' condition. Therefore, it is suggested that the guideline developers in China should develop clear, explicit, and transparent CPGs based on the RIGHT checklist.

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval This article does not contain any studies with human participants or animals performed by any of the authors.

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Literature search strategy, inclusion criteria, and exclusion criteria

Tables 3a, 3b

Literature search: We searched Chinese Biomedical Literature Service System (CBM), China National Knowledge Infrastructure (CNKI), Wanfang Data, VIP database, Medline, Embase, Allied, and Complementary MEdicine Database (AMED), and Medlive and Google Scholar (Google academics), with publication date during 1st January, 2014 and 7th November, 2018. We also searched UpToDate, DynaMed, Clinical Evidence, Essential Evidence Plus, and Best Practice for complement. The search formula is as Tables 3a, 3b show, search words were adjusted to adapt to each database, based on the foreign language database keywords referring to Medline and the Chinese database keywords referring to CNKI.

Table 3a Search strategy of recommendations on diabetes treatment in CPGs (Medline)

#1. Diabetes mellitus/
#2. Diabetes/
#3. Diabet*.ti,ab
#4. Prediabetes.kw,ab
#5. Impaired glucose tolerance.kw,ab
#6. Impaired fasting glucose.kw,ab
#7. OR/#1-#6
#8. Guidelines as Topic/st [Standards]
#9. Guideline.pt
#10. Guideline*.ti,ab
#11. Guidance.ti,ab
#12. recommendation*.ti,ab
#13. consensus.ti,ab
#14. OR/#8-#13
#15. #7 AND #14

Table 3b Search strategy of recommendations on diabetes treatment in CPGs (CNKI)

#1. "指南" /st
#1."指南"/st
#2. "指南" .kw,ti
#3. "推荐" .kw,ti
#4. "建议" .kw,ti
#5. "共识".kw,ti
#6. OR/ #2-#5
#7. "糖尿病" .ti,kw
#8. "糖尿病前期" .kw,ab
#9. "糖耐量异常" .kw,ab
#10. "空腹血糖受损". kw,ab
#11. OR/#8-#10
#12. "解读" .ti
#13. "声明" .ti
#14. "研究".ti
#15.OR/#12-#14.
#16. #6 AND #7 NOT #14

Inclusion criteria: (PI)

P: Guidelines aim at adult patients (aged over 18 years old) diagnosed of diabetes, prediabetes, impaired glucose tolerance, and impaired fasting glucose.

I: Guidelines of medical treatment for diabetes, including comprehensive treatment/management, drug therapy, nutrition guidelines, and dietary recommendations.

Exclusion criteria: Include (1) literature that are not CPGs or recommendations or irrelevant to diabetes treatment; (2) duplicate literature or old version guidelines; (3) particular population with diabetes: gestation, children, or adolescents (aged <18 years old); (4) guidelines on diagnosis and management for diabetes complications or combining other diseases; (5) nontherapeutic guidelines for diabetes, including guidelines for diabetes diagnosis and screening, exercise, and care.

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