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Review Article

Iran Diabetes Research Roadmap (IDRR) Study; Trends of Publications in Management of Diabetes in Iran: A Review Article

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Abstract

Background: This study conducted to assess publications of diabetes treatments to understand research gaps and priorities to guide a management map for future strategy of diabetes research in Iran.

Methods: All studies published from the beginning until 2015 in national and international journals by Iranian authors conducted in the field of diabetes. This comprehensive search strategy without any limitation obtained 8668 publications in international journals and 16921 documents in national journals (25589 documents). Finally, 1019 diabetes management articles were included in this study. Each article categorized based on the study design, subject area, the World Health Organization (WHO) classification and Australian Standard Research Classifications.

Results: There was an increasing trend in a number of publications. Top subject areas were "traditional treatment" with global publication share of 25.8% and "Control of diabetes" ranked the second (24.9%). According to WHO classification, the highest number of productions was in "Basic Research" area (39%) and Australian Standard Research Classification showed 59% of the articles were in "Clinical Medicine and Science" area. Study design of 39.9% articles was basic studies, 23.1% were randomized clinical trial and 21.9% were cross-sectional.

Conclusion: This study showed a relatively ascending trend of scientific publications in the field of diabetes managements in Iran. We can identify the research gaps and research priorities for diabetes management research for future studies. In Future, management map with other diabetes area research maps will be compiled into a single "Roadmap for Diabetes Research in Iran".

Keywords: Diabetes mellitus, Roadmap, Management, Iran

Introduction

Diabetes is a complex metabolic disorder with hyperglycemia and disturbances of fat and protein metabolism resulting from defects in insulin secretion, insulin resistance or both (1). People with diabetes have a significantly increased risk of

complications (2). Its prevalence is increasing dramatically, especially in developing countries (3). Almost 382 million people (8.3%) have diabetes in 2013, and it is expected the number of people suffering from the disease will reach beyond 592 million in less than 25 yr. Moreover, about 80% of them live in developing countries, where the epidemic is gathering pace at alarming rates (4). The Middle East and North Africa Region (MENA) is one of the hot spots of diabetes in the world. Across the region, about 35 million people have diabetes as well as, over 4.6 million cases of diabetes are in Iran (5). The burden of diabetes is well illustrated by the fact that while 3% of a total population is treated for diabetes and its complications, the disease consumes around $ 548 billion in health expenditure (11% of health care budget worldwide) (4).

Given incidence and economic effect of diabetes, improving care has been prioritized for health services. Good management of DM with pharmacological and non-pharmacologic treatments is important and contains patient education, treatment glycemia and complications, hyperlipidemia, hypertension, and other risk factors (6).

These findings, along with the epidemiological and financial data, point to an imperative need to broaden research strategies for prevention and management of diabetes and its complications. A critical goal for research is to find ways that create lasting health benefits for people with or at risk for diabetes and alleviate the societal burden of this devastating disease.

In this study, we focused on the researchers conducted in the field of pharmacological and non-pharmacological treatments (except lifestyle changes) on diabetes in Iran. Our goal is to undertake a survey of the current research in Iran, identify gaps and research priorities to draw a management map for future strategy of diabetes research in Iran.

Materials and Methods

This study is a part of the Iran Diabetes Research Roadmap (IDRR) study. Eleven expert groups comprising leaders in different fields of diabetes research were brought together to carry out the mapping. This study included all studies published from the beginning until 2015 in national and international journals by Iranian authors conducted in the field of diabetes. International databases including PubMed, Web of Science and Scopus as well as national databases including Scientific Information Database (SID), Indexing Articles Published in Iran Biomedical Journals (IranMedex) and Iranian Magazines Database (Magiran) were used as the source of information. The keywords used for English database search were "Diabetes mellitus" and "Iran*" in the author affiliations. These key terms were used according to each database instruction and were combined using "AND" and "OR" operators appropriately. For search in national databases equivalent Farsi keywords were used. This comprehensive search strategy without any limitation obtained 8668 publications in international journals and 16921 documents in national journals (25589 documents). The study method was explained in details on the study protocol (7).

In the next step, all obtained articles from databases were merged and categorized according to the articles' titles to eleven groups. Each category was assigned to a study team member. After assignment, duplications were removed by reviewing the document title as well as the journal volume and issue. These studies underwent screening based on the abstract and content if required. In this stage, unrelated topic, letter to the editors, meeting abstracts, news, as well as studies on foreign population and studies of Iranian authors with foreign affiliation were excluded and finally, 5537 documents remained.

Each member categorized, assigned documents based on the study design, subject area, Australian Standard Research Classifications (8) and the WHO classification (9). The study design is the formulation of studies in medical, clinical and other types of research (e.g., epidemiological). There are many ways to classify research designs, but sometimes the distinction is artificial and other times different designs are combined. Scientific studies can be classified as "Observational Studies", "Basic Studies", Experimental

(Interventional) Studies, and "Meta-Analysis–Systematic review"(10).

Another method for classification of studies is by subject area. While improving blood glucose is the main factor of treatment of diabetes and significantly reduces the rate of diabetic complications, but control of blood pressure and hyperlipidemia can be effective in the diabetes management.

The research field of this article is a diabetes management contains pharmacological and non-pharmacological treatments (except lifestyle changes). We categorized diabetes management publications in 10 subject areas.

These include:

- Oral anti-diabetic agent drugs
- Other oral agent drugs
- Insulin therapy
- Combination therapy
- Traditional treatment
- Supplement therapy
- Novel therapy
- Control of diabetes
- Hypertension treatment in diabetes
- Hyperlipidemia treatment in diabetes

Results

The electronic database search identified 2140 diabetes management articles. In title and abstract evaluation step, 951 articles were excluded. One hundred seventy articles were excluded at the time of duplication assessment. Finally, 1019 articles were included in this study.

Time-trend in articles

Fig. 1 shows that the distribution of document types in diabetes management. There are three peaks in the number of published articles in years 2011, 2013, 2014 compared to previous years. The highest number of articles were in 2013 (19.8% equivalent to 202 documents) while the lowest products were in 2000 (0.9% equivalent to 9 documents). The correlation reflecting the association between number of articles and year of publication was 0.873 (P <0.001). The R-squared value of 0.762 suggests a significant increase since before the years 2000 to 2014.

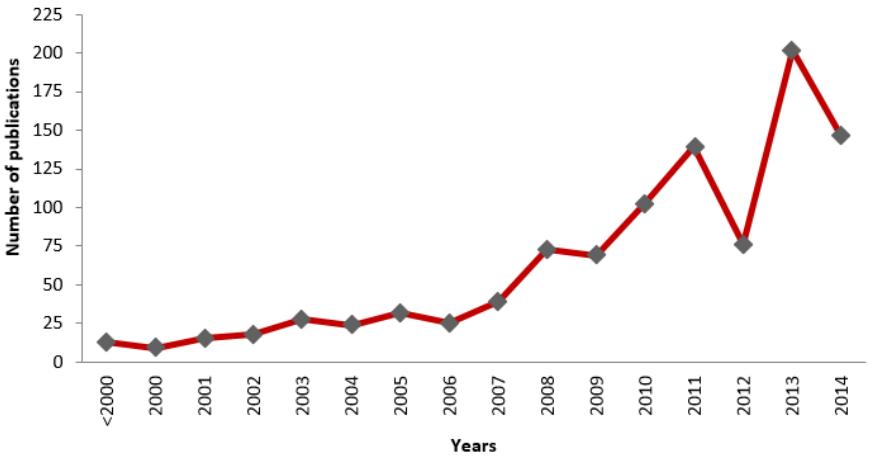

Fig. 1: Time-trend distribution of document types in diabetes management

Subject area

Top subject area was "traditional treatment" with global publication share of 25.8%. "Control of diabetes" and "Hyperlipidemia treatment in diabetes" ranked the second (24.9%) and the third (14.5%) rank, respectively (Fig. 2).

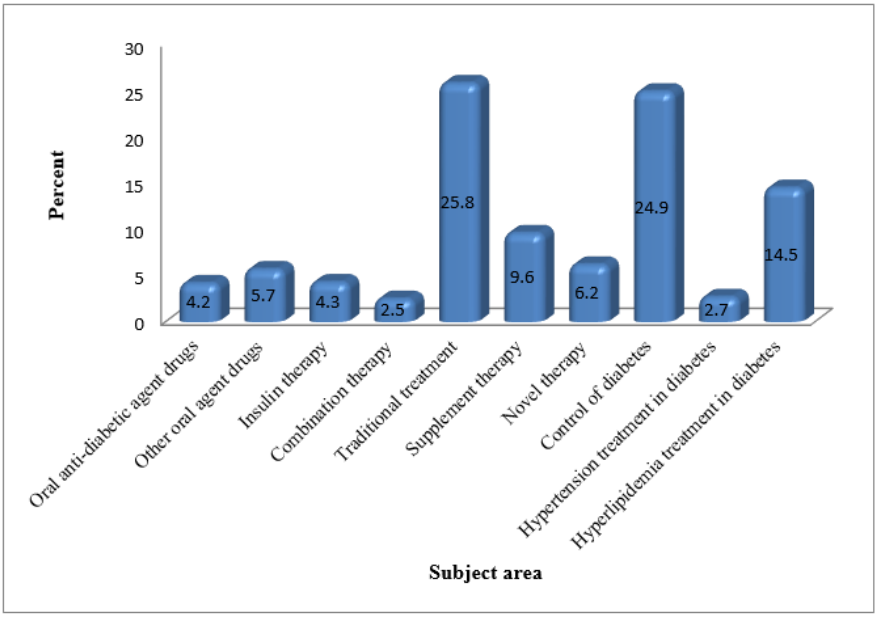

Fig. 2: Frequency of publications in different Subject area of diabetes management

WHO classification &Australian Standard Research Classification

Characteristics of the articles summarized according to "WHO classification", the highest number of productions was on "Basic Research" area (39%) followed by interventions (29%) and distributions (24%), respectively. The lowest publications were in "Review Studies" area (8%).

In accordance to the Australian Standard Research Classification fifty-nine percent of articles are in "Clinical Medicine and Science" area and 41% of these are in "Basic Science" area.

Study design classification

39.9% articles were basic studies, 23.1% papers were randomized clinical trial and 21.9% publications were cross- sectional studies (Fig. 3).

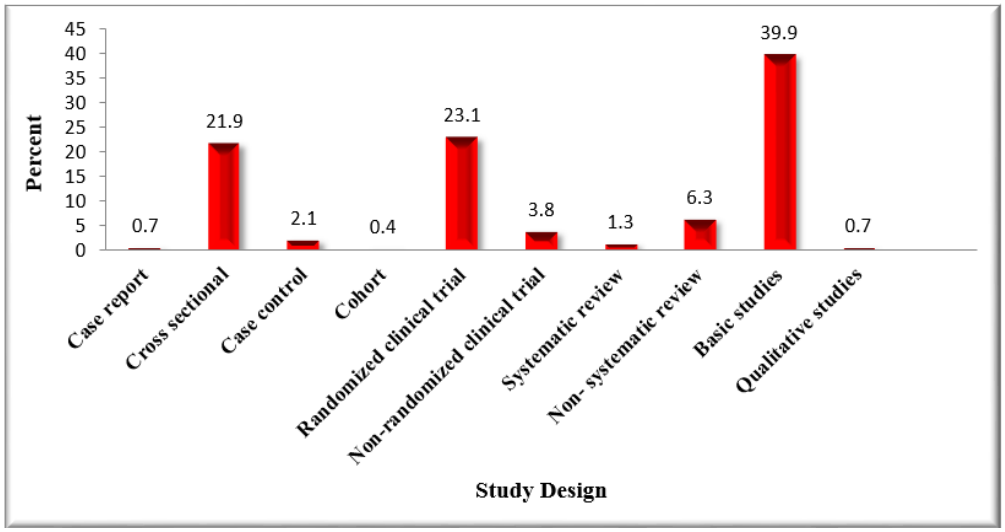

Fig. 3: Distribution of publications according to study design

Discussion

This article reviewed the trend in publications considering the management of diabetes. Although our findings showed an increasing trend in published articles in studying the field, we found some temporary declines in the years' 2009, 2012, and 2014. The reason may be related to negative international sanction against our country, Iran as such dropout was also observed in our previous study (11,12)

This development is attributed to the capability of human resource education, equipment and support by the authorities and scientific managers in research affairs and also more investment in science production (13). The increase in scientific publications in the field of diabetes management only indicates the quantitative increase of scientific papers in this field, but in order to evaluate scientific activity, defining the quality of the published articles becomes an important issue (14, 15).

The majority of published products in subject area were traditional treatment. There is a remarkable point that Iranian traditional medicine is one of the holistic medical subjects with several hundred years of history. Besides, this subject has been revived by WHO recommendations for performing more scientific studies in alternative national medicine and diabetes (16). The increasing trend in the field of our study is in this direction.

In addition, the researchers showed very interest towards publications in control diabetes; consequently, followed by monitoring blood glucose, self-care behaviours in people with diabetes, good problem-solving skills and finally effect factors on control hyperglycemia (17). In other words, greater interest in research was devoted to the field of disease control compared to other subjects such as novel therapy, which today, is very important in diabetes management in the world. Over the past several years, novel therapy such as islet transplantation, stem cells therapy & regenerative medicine have been developed as the promising methods to achieve strict control of blood glucose and a potential cure for diabetes, especially type 1 diabetes (18, 19).

Publications made a small proportion of science production in the field of novel therapy. Though gradually the number of publications has increased in novel therapy field in other countries, our researchers should pay attention to this area.

Most of study design of our publications was basic studies, RCT and cross-sectional studies. Over one-third of the manuscripts were basic studies. These studies include animal experiments, cell studies, biochemical, genetic and physiological investigations, and studies on the properties of materials. Although, according to the evidence pyramid, the basic studies produce the lowest reliable evidence, but many of these studies are new areas of research and their findings may lead to a better understanding of the mechanism of drugs and effective factors in the treatment and control diabetes (20).

In our study, randomized clinical trials (RCT) have shown an up-going trend between publications. These trial articles produce the strongest evidence after systematic reviews in pyramid evidence (21). These types of articles have shown an increasing trend in other countries (14) as well as our preliminary study (12) which is compatible with our study. Moreover, Iran has the second rank of clinical trial articles after Turkey in Islamic countries (14). This increased may be attributed to the researchers' interest and the scientific journals' authorities' tendency towards publishing such papers. Although trials are expensive and time-consuming, emphasis is placed more on clinical trials in health decision-making (10).

Since the cross-sectional studies are relatively quick and inexpensive, our researchers show higher interests towards this type of articles, but cohort studies are less favored due to being very time to consume and expensive (22). Descriptive studies such as cross-sectional studies have been the most used method by Iranian researchers and also studies performed worldwide (14, 23). Although this type of studies may give valuable information regarding the health pattern and its determining factors, they cannot provide direct evidence about the state of change and are not perfect in policymaking (23).

The number of systematic review articles was limited. Based on the facts that systematic reviews are with high-level evidence to answer clinical questionnaires and policies making in health issue for physicians and policy makers, our researchers have not mentioned the importance of these studies (24).

Our study had some strengths and limitations. Although the number of diabetes management publications has grown considerably in recent years, but quality is more important. In order to present a judgment of paper quality, we should rank all of publications using a validated level evidence scale in future studies. Another limitation was that some studies may overlap with other groups of diabetes research; consequently, it may confound the results. For the first time, this study focused on diabetes management in Iran. Moreover, we used some international and national databases that have high coverage in multidiscipline branches of science published from the beginning until 2015.

Conclusion

There is a relatively ascending trend of scientific publications in the field of diabetes managements. The academic expert members, health care professionals, clinicians, researchers and key stakeholders can identify the research gaps and research priorities for diabetes management research for future studies. Focus group of management will identify comprehensive and useful map which will take the appearance of finding gaps and research priorities. Management map with other diabetes area research maps will be compiled into a single "Roadmap for Diabetes Research in Iran" to maximize the strengths and opportunities for future diabetes research in Iran. The roadmap will cover diabetes research from molecular studies to clinical science and health care delivery. All stakeholders such as patients, researchers, and policymakers in Iran will benefit from this map.

Ethical considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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