

Technology Contribution to Prevention of Noncommunicable Diseases

Dear Editor,

Based on available data of the World Health Organization (WHO) in 2008, noncommunicable diseases (NCDs), including cardiovascular diseases, cancers, diabetes mellitus, and chronic respiratory diseases are the leading causes of death in the world.¹ Of note, 80% of NCD deaths occur in low- and middle-income countries. Although 48% of NCD deaths were due to cardiovascular diseases globally, over 80% of cardiovascular and diabetes deaths occurred in low- and middle-income countries. It is also anticipated that NCD deaths increase by 15% globally by 2020, but by 20% in the WHO regions of Africa, South-East Asia, and the Eastern Mediterranean.¹ These alarming facts can be warning hints to decision makers to take more effective actions with finite health budget.

According to national health surveys for surveillance of risk factors of NCDs in Iran, it has been found that in those older than 25 years, the prevalence of diabetes mellitus increased from 7.87% (95% confidence interval [CI], 7.64 to 8.10) in 2005 to 9.19 (95% CI, 8.26 to 10.11) in 2007 and 10.63 (95% CI, 9.05 to 12.21) in 2011.² Moreover, the prevalence of obesity (body mass index ≥ 30 kg/m²) and central obesity in the 3rd National Surveillance of Risk Factors of NCDs in 2007, were 22.3% (95% CI, 20.2 to 24.5%) and 53.6% (95% CI, 50.4% to 56.8%), respectively. There is no doubt that physical inactivity is a serious risk factor for not only obesity but also diabetes. It has been shown that 40% of Iranian adults (31.6% of men and 48.6% of women) have low physical activity.³

From the economic point of view, it has been shown that the average medical cost per capita of type 2 diabetes mellitus in Iran in 2009 was US\$ 842.6 \pm 102 (8.7% of total health care expenditure). The largest share of the expenses (48.9%) were attributed to complications with the highest rank related to cardiovascular disease and nephropathy in both sexes with 42.3% and 23%, respectively.⁴ Another disturbing piece of information was the 2-fold increase in the proportion of new cases of end-stage renal disease due to diabetes mellitus,

from 16% in 1997 to 31% in 2006.⁵ Similar findings in different areas were the primary triggers for chronic kidney disease screening projects in different countries. All the studies similarly found diabetes mellitus as a serious risk factor for chronic kidney disease.⁶ There are data from India that although 70% of the more than 1 billion population lives in rural areas, most of diabetes management and screening programs are focused in urban areas.⁷

According to previous data, it seems that the target group should be general population at large and all countries especially developing ones should take action more seriously and faster than before. However, the main question would be how the public could be approached effectively to generate the desired life style and maintain the effect, with the potential to increase its impact. On the one hand, technological changes came from all sides and challenge us to think differently regarding everything, including communication in our world, and on the other hand, globalizing processes have undeniable effects on cultural activities, which disguise the barriers of effective communication. Therefore, health authorities in response to one of the most important demands of human being need to use the opportunities of new facilities of telecommunication to overcome the obstacles appropriately.

Thanks to enormous development of internet in the world, decision-makers have been urged to expand telehealth to various populations, regions, and health conditions to make it more feasible and affordable. Gradually, health services can be changed from episodic management of illness to proactive persuasion of lifelong modification to prevent disease.^{8,9} Telemedicine which exchanges medical information via telecommunication technologies covers a growing variety of applications and services from 2-way video, email, short messages, and wireless tools to electronic referral service.¹⁰ Interactive applications may even help to change the passive role of people to active partner in healthcare regardless of the distance between two sides. Although it depends on the infrastructure

development of each country, it is not a fantasy for developing world anymore.

Ghana launched a national ehealth strategy in 2010 to increase access, especially in rural areas, to bridge equity gap in the health sector through pilot projects with personal digital assistants, simple and smart phones. Although all of them have not been implemented, some are still in use.¹¹ Similarly, Mohan and colleagues reported a model of *telediabetology* mobile van equipped with appropriate facilities and satellite technology to screen diabetes and its complications in addition to deliver necessary medical care to remote villages in southern India.⁷ Thorsteinsen and colleagues used rule-based website and mobile phone intervention to increase physical activity efficiently. They showed receiving personalized text messages by short message service with relevant educational information and some tangible tips on what to do increased not only the duration of weekly exercise but also its intensity. They could reach people where they were, an easier way to try to change behavior. They also emphasized on the capability of text messaging especially in less developed countries.¹² The Mobile for Reproductive Health program in Tanzania created short message service portal for users to access information on family planning methods without charge and waiting in long queues in clinics.¹³

Iran became the second country in the Middle East connected to the internet in 1993, with more than 23 million of the population with internet access and a growth rate of over 20% in telecommunication. Although Iran got the 174th rank among 181 countries regarding internet speed, its internet users got the 25th rank among 198 countries, which means a penetration of 28.3%. Moreover, in 2014 over 61.2 million people have owned mobile phones.¹⁴ This means telecommunication infrastructure does exist for such approaches, especially on the subject of public education and life style modification. We suggest that research centers start such projects to provide enough solid data of cost, efficacy, and success to help decision makers to redirect some of the health budget to such electronic initiatives.

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