Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Alcohol intake in an attempt to fight COVID-19: A medical myth in Iran

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ABSTRACT

The coronavirus disease 2019 (COVID-19) spread rapidly worldwide and led to the deaths of thousands of people. To date, there is not any vaccine or specific antiviral medicine that can prevent or treat this virus. This caused panic among people who try their best to prevent being infected. In Iran, methanol poisoning was reported and led to the death of hundreds of people in several provinces. The incident occurred after a rumor circulated in the country that drinking alcohol (ethanol) can cure or prevent being infected by COVID-19.

Brief report

Coronavirus disease is an infectious disease that first appeared in China in December 2019. The symptoms of this virus range from mild to severe illness, and in some cases, it might lead to death (World Health Organization, 2020f). The most common symptoms are fever, dry cough, and fatigue. Less common symptoms include aches and pains, nasal congestion, headache, conjunctivitis, sore throat, diarrhea, loss of taste or smell, rash on skin or discoloration of fingers or toes (World Health Organization, 2020g), or nausea (Harvard Health Publishing, 2020). Other symptoms are severe such as difficulty in breathing or shortness of breath, chest pain or pressure, loss of speech or movement (World Health Organization, 2020g), high fever, or severe cough (Harvard Health Publishing, 2020). Some infected people might be asymptomatic (Harvard Health Publishing, 2020). The long-term consequences of COVID-19 on physical and mental health are still under study (Citroner, 2020; Farahmandnia, Hamdanieh, & Aghababaeian, 2020). This outbreak evolved rapidly, and the World Health Organization (WHO) declared COVID-19 a pandemic on March 11, 2020 (World Health Organization, 2020i). As of April 8, 2020, according to the WHO, there were more than 1,356,780 confirmed cases in 212 countries, and 79,385 people have lost their lives (World Health Organization, 2020h).

Risk communication is vital during public health response to disease outbreaks and health emergencies. It influences changing the behavior of people by informing them about the potential risks and ways to protect themselves (World Health Organization, 2020d). Communication channels from which individuals acquire information and critical updates include direct contact from others (e.g. phone calls and texts from friends and/or family), traditional media (e.g. radio, television, online news), and social media (e.g. Twitter, Facebook, Instagram, etc.) (Jones, Thompson, Schetter, & Silver, 2017). In disasters or emergencies, communication errors can occur. Conflicting messages might emerge due to misunderstanding, mistrust, and rumors. If people do not trust the organization or agency publishing the information, they will not follow their advice, and will tend to be vulnerable to rumors and conflicting information from unofficial communication channels that they trust (Centers for Disease Control and Prevention, 2017). WHO states that rumors might include misinformation, myths and harmful practices, information that harms reputation and diminishes trust in agencies, and information that poses public health risks (World Health Organization, 2020c). The main conditions for rumor generation are ambiguity about the situation, high importance, and anxiety (Jones et al., 2017).

Since the coronavirus is highly contagious and in the absence of specific vaccine or treatment (World Health Organization, 2020f), people were overwhelmed with fear, anxiety, and stress about the disease. Fear can affect the way they respond to this outbreak (Centers for Disease Control and Prevention, 2020b). This includes believing rumors (Federal Emergency Management Agency, 2020),

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which might lead to more harmful consequences than the virus itself.

In Iran, the first cases of the novel coronavirus disease were officially reported on February 19, 2020 in Qom city. As of April 8, 2020, Iran had reported 64,586 confirmed cases and 3,993 total deaths (World Health Organization, 2020h). Knowing that the preventive measures include continuously washing the hands with soap and water or with alcohol-based hand rub (World Health Organization, 2020b) and disinfecting surfaces with alcohol solutions (Centers for Disease Control and Prevention, 2020a), some people in Iran also began drinking alcohol. Since Iran is an Islamic country, selling, consuming, producing, and distributing alcoholic beverages is banned (Aghababaeian, Araghi Ahvazi, & Ostadtaghizadeh, 2019). Therefore, people can only access smuggled or illegally homemade alcoholic beverages that are distributed in the black market (Lankarani & Afshari, 2014). Methanol poisoning has been reported several times in previous years in Iran (Fig. 1) (Aghababaeian et al., 2019); however, this time it was due to rumors and misinformation that linked alcohol intake with preventing or treating COVID-19 (Iranian Legal Medicine Organization, 2020b).

From March 7 to April 8, 2020, all Iranian provinces reported methanol poisoning cases, and 26 out of 31 provinces reported deaths due to methanol consumption (Iranian Legal Medicine Organization, 2020b). Usually methanol is intentionally added to illicitly and informally produced alcoholic drinks since it is cheap and widely available in the market (World Health Organization, 2014). As of April 8, the official reports from the National Emergency Organization, Forensic Medicine Organization, and Ministry of Health and Medical Education in Iran showed that more than 3000 people had been poisoned by methanol, of whom 1066 were hospitalized, 73 were admitted to intensive care units (MagIran, 2020), and 728 had died (Iranian Legal Medicine Organization, 2020b). The cause of death of 471 people was directly linked to consumption of illicit alcohol, most likely from methanol poisoning. 422 were male and 49 were female. The other 257 cases are still under investigation (205 were male and 52 were female). Moreover, the age of the deceased from methanol poisoning ranged between 14 and 78 years. Tehran province recorded the highest number of deaths (absolute number of 192 cases). The reported cases and deaths were based on patients' histories, clinical symptoms, blood tests, toxicology tests, and autopsies. It is important to note that the total number of deaths due to methanol consumption in the same period of the previous year (March and April 2019) was only 66. This means that the death toll increased 11 fold (Iranian Legal Medicine Organization, 2020b).

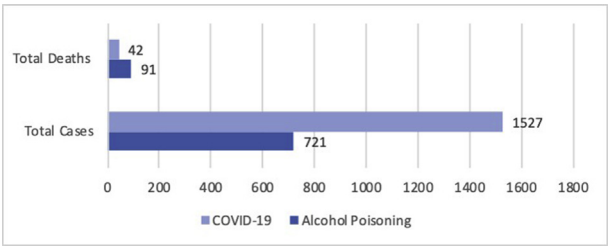

Fig. 2. COVID-19 and alcohol poisoning cases in Fars province

In some provinces, the total deaths from methanol poisoning exceeded that of COVID-19. For example, in Fars province, the fatality rate from methanol poisoning reached 12.6% (IRB News Agency, 2020). However, only 2.7% died from COVID-19 (Fars University of Medical Sciences, 2020) (Fig. 2). This highlights that

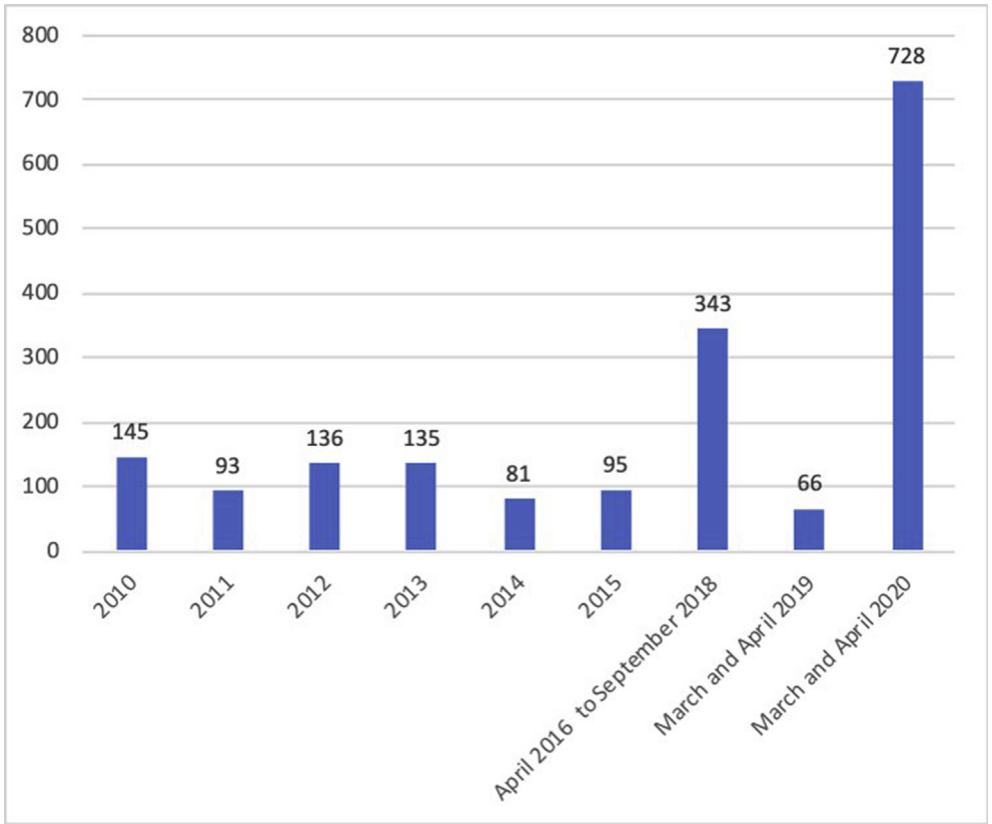

Fig. 1. Deaths due to methanol poisoning (Javaonline, 2018; Khabaronline News Agency, 2018; MagIran, 2016)

the fear and worry from being infected by the virus can lead to detrimental consequences.

With respect to the time of diagnosis, death from alcohol poisoning happens more quickly than death from COVID-19. Hence, if the cases were to be followed for a longer period of time, the difference in mortality rates might be narrower.

Three main factors led to the occurrence of this incident:

1) Lack of public awareness about the prevention and treatment of COVID-19 and different types and uses of alcohol (Aghababaeian et al., 2019).
2) Selling methanol instead of ethanol. In Iran, manufacturers must add coloring to methanol so people can easily differentiate between it and ethanol (colorless), but some alcohol bootleggers add bleach to methanol to make it colorless. Thus, they sell it as if it were ethanol (Australian Broadcasting Corporation News, 2020).
3) Disseminating rumors and misinformation via social media about alcohol use for the prevention and treatment of COVID-19. This included encouraging people to drink or gargle alcohol to prevent or cure the novel coronavirus (Iranian Legal Medicine Organization, 2020b).

Based on what was mentioned and the available information, it is important to highlight several issues about the incident:

a) Because methanol is toxic, internationally recognized references and guidelines do not recommend the use of methanol for disinfecting hands, skin, medical supplies, and surfaces (such as door handles, desks, floors, etc.) (World Health Organization, 2020d; 2020h).
b) Methanol has few disinfectant properties, and oral methanol consumption is associated with severe intoxication, blindness, and death (World Health Organization, 2020a).
c) Alcohol intake will not prevent infection by the novel coronavirus; however, it is associated with the risk of methanol poisoning (World Health Organization, 2020a).
d) For disinfection, people should only buy standardized products containing alcohol (ethanol) from reliable sources (Iranian Legal Medicine Organization, 2020a).
e) Emergency management officials should always disseminate updates to the affected population about risk management and health and safety issues to mitigate uncertainty and rumors, and to encourage the public to remain skeptical about information coming from unofficial channels (Jones et al., 2017).
f) Effective risk communication helps avoid speculation and reduces/prevents personal and public health risks in emergency situations. Ensuring that the right message is communicated with the public at the right time from the right person can save lives (Centers for Disease Control and Prevention, 2018).
g) The effective communication plan should include social media strategy. Social media are widely used to educate the public about risk, risk management, and health and safety issues (Centers for Disease Control and Prevention, 2014).
h) Monitoring rumors can be done via mainstream media, hotlines, social media, SMS messages, focus groups, feedback from community influencers and community volunteers. Successful response is linked to understanding people's concerns, fears, and their levels of knowledge and practice (World Health Organization, 2020e).
i) The main reason for recurrence of methanol poisoning incidents in Iran is that the authorities are not taking the needed measures to address this issue, which led to the absence of public awareness (MagIran, 2020). Even if consuming alcohol is prohibited, it is critical to educate people about different types of alcohol and the related health impacts. Additionally, the public should be informed that the available "ethanol" might actually be methanol. The fear of being arrested when going to hospitals might have worsened the situation. In this context, the patient should know that there is no policy in the hospitals in Iran to report alcohol users to the justice authorities and that this information is considered highly confidential (Aghababaeian et al., 2019).
j) In Iran, the surveillance and early warning systems for alcohol poisoning should be improved (Aghababaeian et al., 2019).
k) The Forensic Medicine Organization and Ministry of Health and Medical Education in Iran are still investigating the causes of this outbreak and the findings might show reasons other than the rumors.
l) There should be cooperation between authorities at the local, national, and international levels to combat the illicit alcohol (World Health Organization, 2014).

Limitation

The limitation in this study is that there is not enough information in the literature about alcohol poisoning and the associated health, social, and financial burden in Iran. This is due to underreporting, strict policies, lack of transparency, and stigma associated with alcohol intake.

Conflict of interest

The authors declare no conflicts of interest.

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