

Preventive measures pertaining to COVID-19 in swimming pools and hot springs in Europe, Canada, United States, and Colombia

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Abstract— The objective of this study is to present a preventive measures pertaining to COVID-19 in swimming pools and hot springs in Europe, Canada, United States, and Colombia. After the start of pandemic, all swimming pools, beaches, and hot springs in Colombia were closed. . Currently, official management plans have yet to be presented for the opening of hot springs and swimming pools. However, the European Association of Water Parks presents a two-stage reopening plan for public recreation centres, while countries such as United States, Australia, Canada, China, and Austria follow similar measures. Among the most representative management measures mandated to prevent the spread of the virus, medical authorities from a variety of governments have collectively recommended the following: i) maintaining rigorous social distancing, ii) cleaning or disinfection of surfaces and common areas routinely, iii) maintaining healthy environments and most importantly, iv) personal care (ie. if not feeling well, stay home and do not put others at risk).

Keywords—COVID-19; hot springs; preventive measures; swimming pools.

Resumen - El objetivo de este artículo es presentar las medidas preventivas relativas al COVID-19 en piscinas y aguas termales en Europa, Canadá, Estados Unidos y Colombia. Cuando comenzó la pandemia muchos alcaldes de Colombia ordenaron el cierre de todas las piscinas, playas y aguas termales. Actualmente, aún no se han presentado planes oficiales de manejo para la apertura de aguas termales y piscinas. Sin embargo, la Asociación Europea de Parques Acuáticos presenta un plan de reapertura en dos etapas para que los gobiernos y las autoridades lo implementen. Otros países, incluidos China, Estados Unidos, Australia, Canadá y Austria, están siguiendo medidas similares. Entre las medidas de manejo más representativas

ordenadas para prevenir la propagación del virus, las autoridades médicas de una variedad de gobiernos han recomendado colectivamente i) mantener un distanciamiento social riguroso, ii) limpiar o desinfectar diariamente las superficies y áreas comunes, iii) mantener ambientes saludables y lo más importante, iv) cuidado personal (es decir, si no se siente bien, quédese en casa y no ponga a otros en riesgo).

Palabras clave — COVID-19, aguas termales, medidas preventivas, piscinas.

I. INTRODUCTION

When the first case of SARS-CoV-2, or COVID-19, was confirmed in Colombia on March 2020, a containment phase was begun on March 6, followed by a quarantine strategy on March 20. The Ministry of Health and Social Protection, as promulgated by Resolution 385, declared a health emergency and adopted sanitary measures to prevent and control the spread of COVID-19 in the national territory and subsequently, to mitigate its effects. Additionally, Resolution 844 (May 26) extended the health emergency of Resolution 385 and ordered the continued quarantining of all citizens until August 31, with sanitary measures of isolation and preventative quarantine for people over 70 years of age (Ministry of the Interior, 2020). With Decree 749 (May 28), mandatory preventive isolation was ordered for all inhabitants in Colombia by the Presidency of the Republic. Article 5 of this decree (Paragraph No. 4) established

a list of prohibitive activities, including “gyms, swimming pools, spas, sauna, steam rooms, sports fields, sports centers, mechanical amusement parks and playgrounds” [2,3].

Right after the start of pandemic, all pools and hot springs, as a proactive measure to contain the spread of COVID-19, were closed by authorities. Similarly, this was the case in many countries including Canada and United States [4, 10, 11].

In addition, while Decree 990 (July 9) enabled a partial reopening to kick-start the economy for all the inhabitants of the Republic of Colombia, no reopening of swimming pools, spas, Turkish spas, saunas, mechanical amusement parks and playgrounds is allowed [2,3].

It has been reported by the United States Centres for Disease Control and Prevention (US-CDC) that there is no evidence of COVID infection in swimming pools, hot tubs, or playgrounds [14]. Chlorine or bromine should theoretically inactivate the virus [11,14, 16].

It has been reported that the main cause of SARS-CoV-2 transmission at rivers, lakes, and swimming pools is through human respiratory secretions or droplets that come out of a person's nose or mouth upon coughing, sneezing, or speaking and subsequently transmitted to other people [13,17].

Therefore, currently the pools and hot springs are open to the public in Europe, Canada, the United States, Colombia and in other countries with their proper biosafety protocols [18], where it is mainly recommended to i) maintain a rigorous social distancing, ii) clean or disinfect surfaces and common areas, iii) maintain healthy environments with good ventilation and most importantly, iv) personal self-care.

II. METHODOLOGY

Many reference sources in the open literature were consulted regarding preventive measures for COVID-19 in swimming pools and hot springs in Colombia, as well as in Europe, the United States and Canada, including publications in official international journals and official websites of organizations such as the World Organization of Health, the Institute of Global Wellbeing and the Ministers of Health of the selected countries. Other sources included Research Centers and Colombian regulations, where the main topics were: i) “preventive measures for COVID-19 in swimming pools and hot springs”; and ii) “Colombian COVID-19 Regulations”.

III. PREVENTIVE MEASURES FOR THE MANAGEMENT OF COVID -19

It has been proven that viruses and bacteria in recreational waters could be properly treated and disinfected with chlorine or other disinfectants as well as other techniques [16]. Disinfection has been mainly made using chlorine, ozone, or ultraviolet (UV)

radiation (with ozone and UV being used in combination with chlorine or bromine) [1, 16].

The Spanish Higher Council for Scientific Research (HCSR) stated that in order to avoid microbiological contamination of water from bathers in swimming pools and spas, disinfection is to be widely implemented and the residual concentration of the disinfection agent will remain present in water, which should be enough for virus inactivation [12]. Like the vapours generated by the water present in a spa or in a medicinal water facility, these will have the same disinfection characteristics as the bath waters of these facilities [13]. Also, the Spanish Superior Council of Scientific Investigations (SCSI) recommends that in those cases in which the environment of the facilities is kept at high temperatures, such as in the case of saunas and steam baths, it is expected that due to the high temperature ($> 60^{\circ}\text{C}$), virus survival is reduced [13].

The European Center for Disease Prevention and Control (ECDC) reported the efficacy of different disinfectants against different types of coronavirus [5]. It concluded that although there were no specific studies on the efficacy of these agents of disinfection against SARS-CoV-2 (COVID-19), the data obtained against other coronaviruses such as SARSCoV (SARS), suggest that the use of a 0.1% sodium hypochlorite solution (equivalent to a 1:50 dilution of a household bleach solution at a concentration of 5%) is effective for virus inactivation.

The COVID-19 are transmitted among people through interaction based on WHO [16].

MEASURES FOR CONTROLLING COVID-19 IN SWIMMING POOLS AND HOT SPRINGS

Europe: the European Waterpark Association, an association of water parks and spas in Europe, has proposed a two-stage reopening plan for all recreation centres while other countries follow the same procedure to reopen those public recreation centres. This reopening plan includes the following: [6, 10,11]

Stage 1: Reopening of waterparks and spas with reduced visitor numbers.

- Protection of cashiers by screens.
- Demarcate at 1.5 m intervals, the pay area, sauna booths, in front of slides or other attractions, and restaurant tables. Only 2 people maximum at the tables (except for families).
- Occupation of only 2/3 of the lockers.
- No saunas.
- Only drinks in self-service restaurant area.
- A minimum distance of 1.5 must be maintained in water courses.
- Adaptation of cleaning and hygiene plans.
- Massages and physical therapy treatments can only be offered if allowed in general physical therapy practices.

- Attachment of soap dispensers to sinks.

Stage 2: Reopening of waterparks and spas in normal operation.

- The number of bathers present at the same time based on the number of available lockers.
- Observation of the distance and hygiene measures.

Canada: According to the Government of Alberta's "Guide for swimming pools and Whirlpools (COVID-19 information)" [7], more restrictive parameters have been detailed with regards to social distancing, which establishes a 2m distance between people, and guests are required to make a prior reservation. Additionally, the Guide recommends the following: [10,11]

- If wrist-bands are required, the operator should use self-applied bracelets and provide waste containers at the facility exit point for their disposal.
- Provide hand sanitizer (60% alcohol or higher) at entry and exit points, and encourage patrons to also bring their own.
- Limit the use of pool toys for flotation aids and lessons only.
- Clean and disinfect shared equipment and launder any rental towels between each use.
- Patrons should not share uncleaned towels, goggles, or any other equipment other than with family members.
- Chlorinated pool water is an effective disinfectant and the risk of transmission from contact with properly treated pool water is considered minimal. Salt water pools are also chlorinated.

United States: According to the County of Los Angeles Department of Public Health's order "*Protocols for reopening of public swimming pools*" [15], to reduce the potential spread of COVID – 19, the following was recommend:

- Water slides, rides or other water attractions at the pool are to be kept closed.
- Indoor and Outdoor pools may be open for routine use. Use of the pool facility must be limited to a maximum of 25 % (indoor) and 50% (outdoor) of pool user capacity.
- Pool users must maintain 6 feet physical distance from those who are not members of their household.
- Visitors arriving at the pool are reminded to wear a face mask at all times (except while in the water) while at the pool or on the grounds of the facility, except when in the pool. This applies to all adults and to children 2 years of age and older.
- Individuals are encouraged to bring their own towels to the pool and should not share towels with those outside of their household.
- Wash hands often or use sanitizer upon entry into the pool facility.
- Improve ventilation, outdoor air intake and indoor air

expulsion to reduce the concentration of virus particles in indoor air.

Colombia: According to "*Guide for the Management and Control of Water Quality in Public Use Pools*" [9], based on the Colombian regulation of swimming pools, the following should be taken into account:

- Guaranteed free residual chlorine of 1 to 3 mg / L.
- Limit use factor (greater than 2.0 m² / bather).
- Recirculation of water for pools for public use: every 4 hours; pools for restricted use: every 6 hours, and pools for private use: every 8 hours.

Additionally:

- Use changing rooms and bathrooms: only one person at the time, respecting distance.
- Own use of towel, bathing suit and hairbrush.
- Shower at home, where possible.

A group of experts at the International Congress "Pool and Spa in times of COVID-19" recommend: [8]

i) minimum interpersonal distance of 2 meters be maintained; ii) a system is also implemented to monitor the number of visitors present and block access; iii) an effective air extraction system is active, as per current legislation; iv) the pool area is equipped with signage of the hygiene standards to be adopted, and v) presence of supervising personnel.

IV. CONCLUSIONS AND RECOMMENDATIONS

In summary, medical and scientific authorities have assisted governments in developing management strategies for containing and combatting the spread of COVID-19. These experts have determined that at swimming pool centers, spas, and hot springs, it is crucial to have a collective awareness and scrupulous adherence to i) social distancing, ii) daily cleaning, and iii) comprehensive disinfection of surfaces, shared objects and common areas, iv) to wear a face mask at all times (except while in the water) and v) maintain healthy environments [6,7, 11, 14, 15].

And most importantly, personal care is paramount. If a person does not feel well, they are exhorted to stay at home and no put others at risk.

In addition to the above, it is important to maintain adequate disinfection of swimming pools. Chlorination and its chemical derivatives are mainly used. In the case of medicinal use, they avoid their use so as not to affect their physical-chemical characteristics and their natural properties, for which constant water renewal methods are used to preserve water quality.

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