

# USERS' PERCEPTION ON THE CHLORINE TREATMENT OF INDOOR POOLS

Author:  
Leonor Gallardo

email:  
leonor.gallardo@uclm.es

Co-authors:  
Fernández-Luna, Álvaro Burillo, Pablo Felipe, Jose Luis Plaza, María Sánchez-Sánchez, Javier

University:  
University of Castilla-La Mancha

Faculty:  
Faculty of Sports Sciences

## Abstract

### INTRODUCTION

Indoor pools have become one of the most attractive sports facilities due to its high intensity of use (Burillo, 2008). The chemical treatment of water has particular relevance because of the direct interaction with swimmers. In Spain, the most common type of chemical treatment is chlorination, due to its low price and effectiveness. However, several studies (Drobnic, 2009; Freixa, 2006, García, 2007; Gomá, 2001) have found that this chemical treatment may cause health problems for swimmers, as itching, allergy, nasal irritation, etc. Usually these problems are due to poor ventilation, inappropriate chlorination levels which do not conform to current regulations or an excess of chloramines (chemicals obtained from the combination of chlorine with different organic compounds dissolved in pool water, as urine). Considering customer satisfaction as a key in managing a sport facility, the objective of this research is to measure the users' perception of indoor pools whose chemical treatment of water is chlorine in aspects like health problems and sensations during the sport practice.

### METHODS

We performed a descriptive study using a questionnaire consisting of a battery of 16 questions with a Likert scale 1-5 and considering variables such as sensations (smell, taste), discomfort and knowledge about the chemical treatment of water. We considered as well respiratory, ear, skin and eye health problems, and finally a general perception of water quality. The sample consisted of 421 users from a total of 20 indoor pools with chlorine treatment in the region of Castilla-La Mancha (Spain).

### RESULTS

Users report that they would improve their swimming practice without odor or chemical taste in the pool. Moreover, the health problems most suffer are the hair and skin dryness and eyes irritation. Users confirm (4 of 5) that the chemical treatment makes significant corrosion in materials and installation, highlighting swimwear. They believe that chlorine is a hazardous substance for users who are directly in contact with it (3 of 5). However, the perception of general satisfaction with water is not low (3 of 5).

Users under 25 years old and most experienced in swimming are who suffer more health problems related to the chlorine treatment, they are less comfortable with the scents and chemical taste as well. In addition, users who previously suffered some type of hearing or allergic disease, have more negative satisfaction with the chemical treatment. On the other hand, users who come to the swimming pool in the morning have more satisfaction than users who come in the afternoon.

### DISCUSSION.

The concentration of chlorine water affects directly to the users, and one of the most common sight is the eyes irritation and skin dryness (Drobnic, 2009). Moreover, the damage of the swimming pools could be reduced with another chemical treatment like ozone (Gomá, 2001). Young swimmers and experienced swimmers (more than 2 years practicing) perceive more health problems because they spend more time in the pool and swim with more intensity. Also people with previous diseases perceive more health problems (Drobnic, 2009), so their general satisfaction is low.

Although user's perception of swimming pool water with chemical treatment with chlorine is not low, maintenance managers recommend using alternative disinfection treatments that cause less problems in users' health such as ozone, salt chlorination or UV treatment (Marcó, 2008). Finally, costumers who come in the afternoon are less satisfied with water because in this timetable the swimming pool has more users at the same time (Mestre, 2002) and the formation of chloramines is higher.

### CONCLUSIONS

- Users agree that their sport practice would improve if the chemical taste and odor produced by chlorine disappears.
- Users are significantly according with the chlorine has a corrosive action in the pool facilities and materials, highlighting the swimwear.
- Experience is one of the most influential aspects. Experienced users are more disappointed, suffer more health problems and know more things about the chemical treatment.
- Users with previous health problems suffer more often the problems described in study.

References:

- Drobnic F. (2009). Impacto sobre la salud de los compuestos utilizados en el tratamiento del agua en las piscinas. Estado de la cuestión. *Apunts Med Esport*; 61:42-47.
- Burillo, P., Rodríguez-Romo, G., Gallardo, L., García-Tascón, M., Salinero, J. J., y Uribe, F. (2008). Análisis cualitativo y cuantitativo de la oferta de piscinas cubiertas en las comunidades autónomas españolas. *Cultura, Ciencia y Deporte*, 3(9), 185-193.
- Calabuig, F., Burillo, P., Crespo, J., Mundina, J.J., y Gallardo, L. (2010) Satisfacción, calidad y valor percibido en espectadores de eventos deportivos. *Revista internacional de medicina y ciencias de la actividad física y del deporte* 10 (40), 577-597.
- Dorado, A. (2006). Análisis de la satisfacción de los usuarios: Hacia un nuevo modelo de gestión basado en la calidad para los servicios deportivos municipales. Toledo: Consejo Económico y Social de Castilla - La Mancha.
- Drobnic F. (2009). Impacto sobre la salud de los compuestos utilizados en el tratamiento del agua en las piscinas. Estado de la cuestión. *Apunts Med Esport*; 61:42-47.
- Freixa A. (2006) Exposición a Cloro en Piscinas Cubiertas. Evaluación y Control, [electronic version] Instituto Nacional de Seguridad en el Trabajo (available in: [www.riesgos-laborales.org](http://www.riesgos-laborales.org)) [Access date: 03/09/2008].
- Gallardo, A., Felipe, J.L., Burillo, P. y Gallardo, L. (2010) Satisfacción de entrenadores y deportistas en los campos de fútbol de césped natural y artificial. *Cultura, Ciencia y Deporte* 15, 189-199
- García B. (2007) Estudio de los niveles ambientales de cloro en las instalaciones deportivas asturianas. *Asturias Prevención*; 10;18-23
- Gomá A. (2001) Implantación de ozonización 100% en las piscinas de la Universidad Autónoma de Barcelona. Barcelona: Bellaterra.
- Marcó, J. (2008). Reducción de cloraminas en piscinas públicas. *Piscinas XXI*, 216, 44-45.